U.S. Department of Transportation

Pipeline and Hazardous Materials
Safety Administration
Washington, D.C. 20590

Preliminary Regulatory Impact Analysis

[Docket No. PHMSA-2018-0080] (HM-265)

Hazardous Materials: Advancing Safety of Highway, Rail, and Vessel Transportation

Proposed Rule

Office of Hazardous Materials Safety

October 2024

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Executive Summary

The purpose of the accompanying notice of proposed rulemaking (NPRM) is to propose several changes to the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180) intended to modernize those regulations governing transportation of hazardous materials by highway, rail, and vessel. The Pipeline and Hazardous Materials Safety Administration (PHMSA) solicited the proposed changes from its modal partners, including the Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), and United States Coast Guard (USCG). These proposals, therefore, incorporate recommendations from FMCSA, FRA, and USCG, and affect regulations governing the transportation of hazardous materials by truck, rail, and vessel.

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, and conducts research to prevent incidents. PHMSA also prepares the public and first responders to reduce consequences if an incident does occur. PHMSA's Office of Pipeline Safety (OPS) oversees the pipeline industry, while PHMSA's Office of Hazardous Materials Safety (OHMS) oversees the transportation of hazardous materials by modes other than pipeline. OHMS works with its modal partners to carry out national safety programs, including security matters, and to protect against the risks to life and property inherent in the transportation of hazardous materials in commerce by all transportation modes. The accompanying rule is being promulgated by OHMS in partnership with FMCSA, FRA, and USCG.

The purpose of this preliminary regulatory impact analysis (PRIA) is to estimate the economic impacts of the changes proposed in the accompanying NPRM. Exhibits ES-1a and ES-1b below present the estimated costs, cost savings, and safety benefits of the proposals contained in the accompanying NPRM, by mode of transportation. Those items identified as cost savings are included as benefits in the "net benefits" row but broken out as cost savings in earlier rows of the table to distinguish them from public safety benefits. In many cases, the provisions in the accompanying NPRM were deemed to be editorial in nature or to have negligible economic impacts. The provisions highlighted in this document are those identified by subject matter experts at PHMSA and its modal partners to be most likely to have potential economic impacts. This subset of the proposed changes has been analyzed for economic impact.

In some cases, after further assessment, an item was deemed not to have appreciable economic impacts. For these items, this document presents a brief description of the proposed change and an explanation for why it was deemed not to have appreciable economic impacts. For other items, data gaps and uncertainties make any calculation of costs, benefits, or cost savings not feasible. For these items, this document describes the nature of the proposed change and an explanation of why calculation of any economic impact that may arise is impossible due to lack of information regarding certain aspects of the proposal. For these items, PHMSA asks for information that may help PHMSA quantify impacts. Finally, for a subset of the proposed amendments, PHMSA was able to calculate monetized costs, benefits, and/or cost savings. PHMSA welcomes comments on these cost estimates and any information that could help refine or improve them. In addition, if any of the provisions not highlighted here are deemed by affected entities to have substantial impacts, PHMSA asks that those entities provide public

comment describing the nature of the impact and, where possible, provide data that would enable quantification of that impact.

Exhibit ES-1a. Total 10 Year Impacts

	2% Discount Rate	3% Discount Rate
Costs		
Rail Costs	$10,343,506	$10,098,010
Motor Carrier Costs	$4,571,944	$4,483,284
Total Costs	$14,915,449	$14,581,294
Cost Savings		
Rail Cost Savings	$64,641,263	$61,987,612
Motor Carrier Cost Savings	$807,539,892	$766,870,458
Total Cost Savings	$872,181,155	$828,858,070
Benefits		
Rail Safety Benefits	$5,680,587	$5,447,388
Motor Carrier Safety Benefits	$11,705,650	$11,116,129
Total Safety Benefits	$17,386,237	$16,563,517
Net Benefits	$874,651,943	$830,840,293

Exhibit ES-1b. Annualized Regulatory Impacts (2019$)

	2% Discount Rate	3% Discount Rate
Costs		
Rail Costs	$1,151,507	$1,183,795
Motor Carrier Costs	$508,979	$525,578
Total Costs:	$1,660,485	$1,709,372
Savings		
Rail Cost Savings	$7,196,287	$7,266,839
Motor Carrier Cost Savings	$89,900,612	$89,900,612
Total Cost Savings	$97,096,900	$97,167,451
Benefits		
Rail Benefits	$632,400	$638,600
Motor Carrier Benefits	$1,303,149	$1,303,149
Total Benefits	$1,935,549	$1,941,749
Net Benefits	$97,371,964	$97,399,828

1. Introduction

1.1. Purpose of NPRM

The purpose of the accompanying NPRM is to propose changes to the HMR governing transportation of hazardous materials by highway, rail, and vessel. These changes include provisions that would either improve the safety of hazardous materials or facilitate more efficient movement of hazardous materials, while ensuring that safety is maintained or enhanced; thus, these provisions would improve safety and facilitate commerce. The accompanying NPRM describes the proposed regulatory changes. This PRIA, though it contains descriptions of the changes and their economic impact, does not contain full and complete regulatory language. The reader is referred to the NPRM for said language. Though every attempt has been made to ensure consistency between this document and the accompanying NPRM, if there is any inadvertent inconsistency between the two documents, the NPRM should be considered the authoritative document.

1.2. Need for Action

Executive Order (EO) 12866 requires agencies promulgating changes to the regulatory code to identify the need for action. EO 12866 defines the need for action in section (b) *The Principles of Regulation.*[1] In that section, agencies are instructed to identify the problem being addressed by the regulation, including "failures of private markets or public institutions" that make Agency action necessary. Specifically, part (2) of section (b) of EO 12866 states the following:

> (2) Each agency shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively.

Updates and modernization of regulations are necessary to accommodate new technologies, new business practices, and, in the context of hazardous materials transportation, new understanding of hazardous materials; how they should be packaged for transportation; and the necessity of ensuring that those engaged in transportation of these materials are aware of the risks they pose and the proper handling necessary to reduce those risks.

A large portion of the accompanying regulatory changes are intended to improve the efficiency of hazardous materials transportation in ways that enhance or maintain safe transport, thereby facilitating commerce while enhancing or maintaining the protection of human life, health, and the environment. In concert with PHMSA's modal partners, revising regulations to achieve this result satisfies a key aspect of PHMSA's mission to advance the safe transportation of hazardous materials.

Other aspects of the proposed regulatory changes in the accompanying NPRM would facilitate hazard communication. Hazard communication is crucial to the safe transportation of hazardous materials. Information asymmetries are one type of market failure for which appropriate regulation

[1] See EO 12866 at https://www.archives.gov/files/federal-register/executive-orders/pdf/12866.pdf.

may be an effective response. Hazardous materials releases in transportation are rare events, but these events can have severe consequences for human health and the environment when they do happen. Hazard communication informs workers in the transportation and emergency response community about the inherent risks posed by the material being shipped. This information enables transportation workers to handle material appropriately, and, in the event of an accidental release, enables transportation workers and emergency responders to take appropriate countermeasures to protect their health, and the health and safety of the general public, in response to such incidents.

1.3. Overview of Proposed Amendments

This PRIA summarizes certain provisions of the NPRM for analytical purposes as well as the reader's convenience. However, the reader is referred to the NPRM for the regulatory text as this PRIA does not specify the language that is proposed or would be codified in a final rule.

As stated above, the NPRM proposes changes to regulations that govern the safe transportation of hazardous materials by three modes: highway, rail, and vessel. The reader is referred to the NPRM for a full explanation of the proposed changes as well as proposed changes to the regulatory text. This PRIA focuses on those provisions only in the NPRM that PHMSA and its modal partners expect might be more than mere editorial changes. The changes proposed in the NPRM are numerous. Although PHMSA and its modal partners have attempted to identify all provisions that might have economic impacts, PHMSA and its modal partners seek comment on whether there are any provisions not assessed in the PRIA that might have substantial economic impacts, as identifying unanticipated consequences can be difficult, especially without input from the regulated community and other stakeholders.

1.3.1. Revisions to Hazardous Materials Regulations for Transport by Vessel

This section of the PRIA presents the most consequential provisions by mode, starting with those developed in cooperation with USCG governing transportation of hazardous materials by maritime vessel. These proposed changes primarily involve hazard communication issues, including shipping paper accessibility requirements; the marking of "RQ" on non-bulk packages of hazardous substances; and the placarding of shipping containers that contain a mix of different types of packaged hazardous materials. The proposed changes impact containers authorized for transporting hazardous materials aboard maritime vessels.

One issue seen regularly by USCG inspectors at certain ports is the inability to obtain shipping papers for containers being inspected in a timely manner. Shipping papers are the primary hazard communication document for hazardous materials shipments; they provide information about the types and quantities of hazardous materials being transported in a container and the risks they pose to human health and the environment. Shipping papers are necessary to complete container inspections. At certain U.S. ports, USCG inspectors wait up to 24 hours to obtain shipping papers from the port. In cases where there is evidence of an imminent safety hazard—such as loss of containment/leakage of hazardous materials—ports are almost universally able to provide shipping papers to inspection staff quickly. However, during routine inspections where no imminent hazard is visible, inspectors must wait up to 24 hours before the port provides shipping papers. Since USCG inspectors cannot complete their inspection of a container until shipping papers have been provided, a delay of up to a full day can impede the quick and efficient completion of inspections,

which wastes both inspector and port personnel time, resulting in a delayed shipment if a container is under inspection and cannot be moved until the inspection is completed.

A second proposed provision involves the marking of "RQ," which stands for "reportable quantity," on bulk packages of hazardous substances shipped by vessel. The "RQ" marking is required for non-bulk packages containing reportable quantities of hazardous substances. However, the current regulatory text for the use of international standards in § 171.23(b), which specifies the applicability of the "RQ" mark, could be interpreted as requiring the "RQ" mark for both non-bulk and bulk packages. The "RQ" mark indicates that a package contains a hazardous substance and, therefore, poses a certain environmental risk in transportation. Bulk packages that contain hazardous substances are not required to be marked with "RQ" because there are other communication requirements, such as placarding. However, shippers sometimes place this mark on bulk packages when transporting hazardous substances by international standards due to the aforementioned ambiguous regulatory text. The accompanying NPRM proposes to remove the ambiguity in § 171.23 and clarify that the "RQ" mark is not required for bulk packages transported under the provisions of international regulations. This proposed change provides potential regulatory relief, and saves shippers time and money, because they would no longer have to apply "RQ" when it is unnecessary.

Finally, intermodal containers that contain non-bulk packages of hazardous materials in different hazard classes may currently be placarded with a "DANGEROUS" placard instead of placards for each hazard class (subject to certain conditions, such as hazardous materials classification and weight). Currently, the "DANGEROUS" placard is authorized for intermodal containers shipped by vessel, truck, or train. The accompanying NPRM proposes to eliminate the use of the "DANGEROUS" placard for shipment by vessel. This proposal harmonizes with international standards as neither the International Maritime Dangerous Goods Code (IMDG Code) nor the International Convention for the Safety of Life at Sea (SOLAS)—the two international standards that govern the safety of international shipments by maritime vessel—allow for the use of the "DANGEROUS" placard.

As a result, when the "DANGEROUS" placard is seen outside the U.S., it is not recognized, nor is it in compliance with international shipping regulations. Therefore, shipments using this placard internationally can be delayed or frustrated due to lack of compliance with international dangerous goods shipping requirements. To avoid this issue, the USCG and PHMSA propose to eliminate use of the "DANGEROUS" placard for vessel shipments both within the U.S. and internationally. This proposed change would require each hazardous material shipped by vessel to be placarded with each hazard class, as is done for shipments originating outside the U.S. Although this change imposes more stringent placarding requirements, USCG believes that in practice the "DANGEROUS" placard is rarely, if ever, seen aboard vessel. Therefore, PHMSA expects the practical impact of the change to be negligible.

Exhibit 1 below presents the baseline-change matrix for the vessel-related provisions assessed in this PRIA.

Exhibit 1. Proposed Changes - Vessel

Regulatory Text Section	Proposed Change	Baseline
171.22	Revise paragraph (f)(4) to require anyone that offers, stores, handles, or transports hazmat to have shipping papers readily accessible for inspection.	USCG inspectors at certain ports have to wait up to 24 hours for port personnel to produce shipping papers. This inconveniences inspections, wastes USCG inspector time, and results in longer than necessary time frames for completing inspections. According to current regulatory requirements, ports must maintain a copy of the shipping paper, or an electronic image thereof, that is accessible at or through its principal place of business. This change would impose more easily enforceable and understood language for promptly providing shipping paper information, improving inspection efficiency and reducing delays.
171.23	Revise paragraph (b) to clarify that the "RQ" mark is not required for bulk packages of hazardous substances in international transportation.	Current regulatory text could be interpreted as requiring both bulk and non-bulk packages to be marked with "RQ" mark for international transportation. However, this requirement was not intended to apply to bulk quantities and bulk packages are not subject to this requirement. This change would eliminate the ambiguity and clarify that the "RQ" mark is only required for non-bulk packages for both international and domestic transportation.
172.504	Eliminate the use of the "DANGEROUS" placard for vessel transportation, thereby requiring the container to have placards for each hazardous class transported in the container.	Currently, the "DANGEROUS" placard can be used for vessel transportation. However, vessel operators can get confused with this placard as it does not conform to international regulations, potentially resulting in delayed or frustrated shipments.

1.3.2. Revisions to Hazardous Materials Regulations for Transport by Highway

This section describes the changes being proposed for transportation of hazardous materials by highway. These changes primarily impact the construction and requalification of cargo tank motor vehicles (CTMVs). CTMVs and other DOT specification bulk packages authorized for hazardous materials transportation must be constructed to specifications prescribed by the HMR. In addition, they must undergo periodic inspection and requalification to ensure they are maintained properly and in proper condition for transporting hazardous materials.

Not all provisions proposed in the NPRM appear in this PRIA. This PRIA focuses on those provisions that PHMSA or FMCSA subject matter experts or economists have identified as potentially meriting assessment for economic impact. Many of the provisions proposed in the accompanying NPRM clarify existing regulatory requirements or are in other ways editorial in

nature. Therefore, these proposed changes are unlikely to impose costs, result in cost savings, or produce benefits relative to the baseline. As presented further below, although many items were deemed to have fairly de minimis economic impacts, PHMSA included those items here to highlight them to industry and other stakeholders for comment in case substantive impacts not anticipated by PHMSA are imposed by the proposed provision. In other cases, PHMSA lacks data to assess certain provisions fully. This PRIA describes the nature of the change, and PHMSA asks for public comment and information to enable PHMSA to more fully assess these provisions. PHMSA begins by providing a summary of the provisions assessed here in Exhibit 2, and then provides a fuller description of the proposed changes below that table.

Exhibit 2. Proposed Changes - Highway

Regulatory Text Section	Proposed Change	Baseline
171.7	Revise paragraph (h)(39) to specify the 1964 edition of ASTM D 1838-64 was reapproved in 1968.	The current incorporation by reference of the 1964 edition contains an editorial error.
171.7	Revise paragraph (n)(21) to IBR the current 1997 edition of the CGA TB-2, reaffirmed in 2015. This includes a name change.	The current incorporated by reference edition of CGA TB-2 is the outdated 1980 edition.
172.704	Revise paragraph (e)(1) to except package manufacturers and testers from the security awareness training requirement.	Package manufacturers and testers are currently required to complete security awareness training.
173.150	Revise paragraph (f)(3) to refer to new bonding and grounding requirements in § 177.837 for combustible liquids or flammable liquids reclassified as combustible liquids in CTMV.	Bonding and grounding are not currently required for cargo tanks transporting or delivering combustible liquids or flammable liquids reclassified as combustible liquids in CTMVs.
173.315	Require post weld heat treatment for newly manufactured nurse tanks.	Currently, post weld heat treatment of nurse tanks is not required in the HMR. However, PHMSA expects that all newly manufactured nurse tanks undergo post weld heat treatment and have done so for years. Therefore, there is no practical impact of this proposed requirement.
177.837	Require bonding and grounding requirements for unloading or loading of combustible liquids and flammable liquids reclassed as combustible liquids in CTMVs.	Currently, bonding and grounding is only required for loading and unloading of flammable liquids. Bonding and grounding prevent ignition of material by static electricity. This change would eliminate allowing hazardous materials with the same or higher flash points from being unloaded or loaded without bonding and grounding, which prevents the chance for such ignition.

Regulatory Text Section	Proposed Change	Baseline
178.345-11	Require that failure of the self-actuating emergency closure system does not cause the release of the contents of a CTMV.	Currently, the HMR does not specify that the emergency self-actuating closure system should not cause release of hazardous material if it is damaged or fails for other reasons. This creates a potential safety concern related to the unintentional release of hazardous materials.
180.407	Add paragraph (a)(7) to require that all equipment and instruments used for a function under part 180 subpart E must be calibrated in accordance with the manufacturer's instructions. The facility must retain appropriate records documenting the type of calibration, date calibrated, and by whom. The facility must retain a copy of the recent and preceding calibration documentation.	The HMR does not currently require that equipment used to test and requalify CTMVs be calibrated or require documentation of the calibration. However, equipment and instruments cannot properly test or requalify CTMVs without being calibrated.
180.407	Add paragraph (a)(8) to allow the use of video cameras or fiber optics equipment for any inspection or test, or portion thereof, provided all the required areas and elements can be viewed and evaluated according to part 180 subpart E. The use of such equipment shall be fully documented on the report required by §180.417.	Currently, video cameras or fiber optics equipment may not be used for any portion of the inspection. Inspections must be done with the naked eye.
180.407	Add paragraph (a)(10) to require that the Registered Inspector must verify with the CTMV owner or motor carrier if there have been any hazardous materials transported in the CTMV that are corrosive or reactive to the cargo tank or components since last test or inspection. The Registered Inspector shall use this information to determine the proper tests and inspections to be conducted.	Registered inspectors are not required to work with the CTMV owner or motor carrier to determine if any hazardous materials corrosive or reactive to the cargo tank or components have been transported in the CTMV prior to or since the last test or inspection. However, this information would help Registered Inspectors to ensure that they are conducting the proper tests and inspections on the CTMV.
180.407	Add paragraph (a)(9) to require that for any test or inspection that requires a CTMV to be tested at a pressure higher than 50 pounds per square inch (psi), the hydrostatic method shall be used, except for MC338 cargo tanks used to transport cryogenic liquids.	The HMR currently allow for either hydrostatic or pneumatic pressure testing. However, the pneumatic pressure test at higher than 50 psi poses significant safety risks due to the potential for a rupture of the CTMV.
180.407	Revise paragraph (d)(2)(i) to require pad attachments that are attached to either the cargo tank shell or head shell be inspected during the inspection of cargo tank shell and heads.	The HMR does not specifically call these inspection elements out for citation as violations.

Regulatory Text Section	Proposed Change	Baseline
180.407	Revise paragraphs (d)(2)(ix) and (g)(1)(iii) to allow for the removal of the upper coupler assembly during inspection, subject to certain conditions.	Currently, the upper coupler must be disconnected during all upper coupler inspections even if the area to be inspected is visible without removing the upper coupler.
180.415	Revise paragraph (b) to require a cargo tank facility to mark the cargo tank facility registration number (CT number) following test or inspection, if not already marked on the CTMV.	Currently, the HMR do not require the cargo tank facility registration number be marked on the CTMV following test or inspection. However, some facilities voluntarily mark cargo tank facility registration number on the CTMV.

1.3.2.1. Section 171.7 Provisions

Section 171.7 lists the documents that PHMSA incorporates by reference (IBR). The first two items presented in Exhibit 2 are proposals related to revising IBR documents. PHMSA has a long-standing practice of incorporating existing industry standards into the HMR by incorporating by reference industry standards documents. In the NPRM, PHMSA proposes to revise editorially one IBR document and update a second IBR document. The current version of ASTM D 1838-64 incorporated by reference into the HMR is the 1964 edition. The accompanying NPRM proposes to revise editorially the title of the document to specify it was reapproved in 1968. PHMSA also proposes to IBR a newer version of CGA TB-2. The current regulatory text IBRs the 1980 edition. PHMSA proposes to update the IBR to the 1997 edition, which is titled "P-26: Guidelines for Inspection and Repair of MC-330 and MC-331 Anhydrous Ammonia Cargo Tanks (formerly TB-2)."

1.3.2.2. Part 172 Provisions

Part 172 contains regulations governing the training of hazardous materials employees. Hazardous materials employees are defined (*see* § 171.8) as employees who load, unload, or handle hazardous materials; prepare hazardous material for transportation; are responsible for the safety of transporting hazardous materials; or operate a vehicle used to transport hazardous materials, as well as employees who work at firms that manufacture, test, inspect, repair, or recondition hazardous materials packaging. These workers must receive training on safely packaging, handling, and transporting hazardous materials on a periodic basis. This training also includes security awareness training, which was implemented to address concerns that hazardous materials in transportation could be used as weapons of mass destruction or convenience.

Currently, certain categories of workers—those who do not directly handle, ship, transport, or package hazardous materials (e.g., those who inspect cargo tanks or rail tank cars; those engaged in the design, manufacture, reconditioning, or testing of hazmat packages; etc.)—are excepted from hazardous materials safety training. The accompanying NPRM proposes to also except these workers from security awareness training. The exception would apply to employees who manufacture, recondition, test, inspect, or repair hazardous materials packaging provided they do not meet other criteria requiring the training.

1.3.2.3. Part 173 Provisions

Part 173 contains general requirements for shipments and packaging of hazardous materials. The changes proposed in the accompanying NPRM that are discussed in this PRIA are found in §§ 173.150 and 173.315. The § 173.150 proposed change is related to a change proposed in part 177 regarding bonding and grounding requirements for combustible liquids and flammable liquids reclassified as combustible liquids loaded or unloaded from CTMVs. PHMSA presents a more detailed description in the discussion of part 177 changes below. The other proposal from this part relates to § 173.315, which governs compressed gas requirements in cargo tanks and portable tanks. Specifically, this proposed change requires post weld heat treatment during the manufacturing of nurse tanks. Nurse tanks are used to store and transport anhydrous ammonia, which is used as a fertilizer. Anhydrous ammonia is a compressed gas that is toxic by inhalation. Hence, its release can pose significant health and safety risks. Post weld heat treatment reduces the probability that a nurse tank weld would fail and, consequently, that a release of a toxic by inhalation substance would occur.

1.3.2.4. Part 177 Provisions

Part 177 contains requirements specific for highway transportation. The proposed change in § 177.837 requires bonding and grounding when loading or unloading combustible liquids or flammable liquids that are reclassified as combustible from CTMVs. Static electricity buildup can occur when transferring flammable and combustible liquids from one containment vessel to another. A static electric charge buildup during loading and unloading can cause ignition of the product being transferred, resulting in a fire or explosion. Bonding and grounding mitigate the buildup of static electricity while loading or unloading product, which prevents fires and explosions during the transfer of product. Bonding and grounding are currently required when loading and unloading flammable liquids, but not required when transferring combustible liquids or flammable liquids reclassified as combustible liquids. Although less volatile than flammable liquids, static electricity buildup to the point of ignition is a concern for combustible liquids and flammable liquids reclassified as combustible liquids. This requirement would prevent such flash fires and explosions from occurring during loading and unloading operations.

1.3.2.5. Part 178 Provisions

Part 178 contains packaging design requirements. The proposed changes impact the actuating systems for emergency closure of cargo tank outlets. Current requirements mandate that if the actuating system is accidentally damaged or sheared off during transportation, each tank outlet must remain closed (i.e., damage to the actuating system should not cause tank outlets to open spontaneously). In addition to damage, PHMSA proposes to add a requirement that if the actuating system fails, the tank outlets must remain closed and retain the product contained within the cargo tank.

A second proposed requirement in this part would require that, when cargo tanks are built, no appurtenances or other equipment obstruct access to the emergency remote shutoff system controls. FMCSA inspection personnel have encountered situations in which appurtenances added to cargo tanks have been added in locations that obstruct access to the emergency remote closure system controls.

1.3.2.6. Part 180 Subpart E Provisions

Subpart E of Part 180 contains regulations for qualification and maintenance of cargo tanks. The regulations in this subpart govern the inspection, repair, and requalification of cargo tanks. Cargo tanks must be inspected periodically to ensure they are still in good condition and fit to transport hazardous materials. There are several proposed changes to the inspection, repair, and requalification requirements in Subpart E of part 180. However, most were deemed to be editorial or otherwise expected to not have economic impacts.

Section 180.405 Provisions

One proposed revision in § 180.405 is considered in the PRIA. This provision is analogous to the provision in part 178 to remove or reposition appurtenances that obstruct access to emergency manual shutoff systems. As with that proposal, this proposed change requires that at, or before, the next requalification, obstructing appurtenances be removed or moved so that the emergency manual shutoff system can be readily accessed.

Section 180.407 Provisions

Of those revisions in § 180.407 assessed for economic impact, the first proposes to require that equipment and instruments used to test and measure CTMVs during qualification and requalification be properly calibrated. Use of properly calibrated equipment is necessary to ensure measurements taken during qualification and requalification inspections are accurate. Inaccurate measurements or test results could result in a CTMV being requalified when it in fact has non-conforming features that should prohibit its use (e.g., shell thickness that is too thin, damage that would impair integrity, etc.).

The second proposal in this section would require hydrostatic pressure testing for any CTMV tested at a pressure higher than 50 PSI. Certain CTMVs must be pressure tested during requalification. Hydrostatic testing involves pumping water or another fluid into the CTMV until a specified PSI is reached. This test ensures that a cargo tank can withstand pressures normally experienced during transportation without leaking or rupturing. Alternatively, the cargo tank can be pressurized with air (i.e., pneumatic pressure testing) to the specified PSI. PHMSA proposes to no longer allow pneumatic pressure testing for cargo tanks that are tested at 50 or more PSI. If a CTMV fails during the hydrostatic pressure testing process, the failure is much less violent, and hence, much less likely to cause death or injury to anyone in close proximity to the cargo tank than if the cargo tank is tested pneumatically. At or above 50 PSI, failure of a pneumatically pressurized CTMV can be very violent, and material that breaks off or detaches can be projected with enough force to cause serious bodily injury or death to personnel impacted by the object. This proposal would, therefore, protect the health and safety of personnel engaged in the inspection and requalification of CTMVs.

The third proposal in this section would revise paragraph (d)(2)(i) to specify that during the visual inspection and testing of the cargo tank shell, all pad attachments on either the cargo tank shell or head shell be inspected for method of attachment. This is already expected in existing inspection requirements, but not specifically called out. Including it in the HMR clarifies the elements that are

required for an inspection, thereby reducing the likelihood of non-compliance. Furthermore, it ensures the pad attachments are properly functioning, which increases safety.

The fourth proposal in this section provides an exception in paragraphs (d)(2)(ix) and (g)(1)(iii) for upper coupler inspection. The proposed change would eliminate the necessity to disconnect the upper coupler in some inspections. Decoupling the upper coupler and then recoupling it takes time. This proposal would, therefore, reduce the amount of time necessary to complete certain inspections.

The final proposal in this section would require cargo tank facilities to mark inspected cargo tanks with the cargo tank facility registration number (CT number). The CT number is a unique identifying number issued to a cargo tank facility when it registers with FMCSA and is authorized to conduct cargo tank requalification inspections. The CT number enables inspection and enforcement staff to identify easily and quickly which cargo tank facility conducted the last inspection of a cargo tank. Although this is a new marking requirement, it is fairly common for cargo tank facilities to mark inspected cargo tanks voluntarily with their CT number even though such a marking is not required.

1.3.3. Revisions to the Hazardous Materials Regulations for Transport by Rail

The third mode covered is rail. In this section, PHMSA and FRA describe the changes proposed for transportation of hazardous materials by rail. Many of the regulatory changes proposed in this rule result from consensus agreement and recommendations from all parties to the Rail Safety Advisory Council's (RSAC) Hazardous Materials Issues Working Group (HMIWG). RSAC is a federal advisory committee whose purpose is to provide the federal government with expert advice from all stakeholders involved in rail transportation. HMIWG is specific to transportation of hazardous materials by rail and is made up of a selection of railroad representatives, including Class I, II, and III railroads, shippers of hazardous materials, manufacturers of rail tank cars, and public safety and environmental advocates. RSAC is organized and led by FRA and HMIWG, and includes participation by representatives from PHMSA. For full information on RSAC, its activities, documents produced, and meeting minutes, refer to FRA's RSAC website at https://rsac.fra.dot.gov/.

The provisions proposed from RSAC were unanimous consensus provisions; that is, provisions agreed to by all members of HMIWG. They involve tank car facility registration; authorization of certain non-flammable, non-toxic by inhalation, compressed gases and certain elevated temperature materials to be moved in trailer or container on flat car (TOFC/COFC) configurations; and inspection and closure procedures for rail tank cars hauling hazardous materials. Another provision would streamline the process for a one-time movement approval (OTMA). FRA grants OTMAs for movement of damaged or otherwise non-compliant rail tank cars containing hazardous materials to facilitate the movement of these tank cars for repair. The process of obtaining an OTMA is onerous and consumes significant FRA resources for processing. Streamlining the process would reduce this burden to FRA and make it possible for railroads to expedite the movement of damaged cars to facilities where they can be unloaded and scrapped or repaired. Another RSAC recommendation evaluated in this PRIA is the requirement for tank car offerors to maintain and update closure instructions for tank cars.

The proposed changes also include new registration requirements for tank car and cargo tank manufacturing, repair, and inspection facilities. Cargo tank facilities are currently required to register with FMCSA. However, tank car facilities are not currently required to register with the Department. At present, neither FMCSA nor PHMSA has the ability to suspend or terminate the registration of cargo tank facilities that fail to manufacture, repair, or inspect cargo tanks to regulatory specification. FRA and FMCSA regularly inspect these tank car and cargo tank facilities for regulatory compliance, and in some instances the facilities are failing to comply with the HMR and manufacturing standards. Therefore, PHMSA proposes to create a tank car facility registration program, with provisions that allow registrations to be suspended or terminated for cause, as agreed to by the members of RSAC HMIWG. PHMSA also proposes to add a suspension or termination component to cargo tank facility registration program requirements. Suspension or termination of registration would prevent facilities from manufacturing, repairing, or inspecting cargo tanks and tank cars authorized for hazmat service when facilities are not performing those activities in compliance with the HMR. Such suspension or termination may be an appropriate punishment and public safety precaution in cases of egregious violations that create severe safety hazards to the public or transportation sector employees.

In addition to the consensus RSAC recommendations provided above, PHMSA proposes a further change affecting rail tank car facilities. At present, rail tank car facilities—facilities that manufacture, inspect, and repair rail tank cars—must have a quality assurance program (QAP) that is approved by the Association for American Railroads (AAR) Tank Car Committee (TCC). AAR is authorized by the HMR to be the sole entity charged with this oversight. AAR TCC is a body of representatives drawn from railroads, tank car shippers, and tank car manufacturers. PHMSA and FRA provide regulatory oversight to the AAR TCC process to ensure the committee is operating within the requirements of the HMR. AAR charges tank car facilities a fee of $10,000 per year to oversee, review, and approve these quality assurance plans. The proposed change would eliminate the requirement that AAR oversee these plans. Instead, the proposed change requires tank car facilities to self-certify that they maintain a QAP that meets the requirements of § 179.7 and submit an executive summary of their QAP to PHMSA with their registration statement. Any tank car facility inspected by either FRA or PHMSA personnel that fails to have an adequate QAP could have the registration to manufacture, repair, or qualify tank cars suspended or terminated. Thus, oversight of QAP would transition from AAR, which charges a fee for such oversight, to the federal government, which would not charge a fee.

In addition, PHMSA proposes to revise the tank car design approval process, which is also currently delegated to AAR TCC. Recently, PHMSA and FRA initiated a review of the current requirements in Part 179 that require tank car design be approved by AAR TCC. PHMSA and FRA expect that the current system requiring AAR approval for tank car designs and tank car facility QAPs is unduly burdensome for the regulated industry. The NPRM proposes to remove AAR's authority to review and approve tank car and service equipment designs. In place of AAR's design review and approval of tank cars and service equipment, the NPRM proposes a review and approval by a Design Certifying Engineer (DCE), a process already in use for cargo tank motor vehicles. PHMSA and FRA expect that a tank car DCE meeting the § 171.8 definition would be able to review the design of a tank car or service equipment and determine whether the design complies with the requirements of Part 179. PHMSA and FRA will oversee DCEs through a proposed registration program.

2. Regulatory Analysis

2.1. Purpose of this Analysis

This analysis has been developed to comply with a variety of Executive Orders related to economic analysis and regulatory planning and review. In particular, Executive Orders 12866 ("Regulatory Planning and Review")[2] and 13563 ("Improving Regulation and Regulatory Review")[3] 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."

Executive Order 13610 ("Identifying and Reducing Regulatory Burdens")[4] urges agencies to conduct retrospective analyses of existing rules to examine whether they remain justified and whether they should be modified or streamlined considering changed circumstances, including the rise of new technologies. The Department of Transportation (DOT) expects that streamlined and clear regulations are vital to ensure compliance with important safety regulations. For this reason, DOT has developed a plan detailing how such reviews are conducted.[5]

Additionally, Executive Orders 12866 and 13563 require agencies to provide a meaningful opportunity for public participation, which also reinforces requirements for notice and comment under the Administrative Procedure Act (APA).[6] For this reason, PHMSA is soliciting comment on our preliminary analysis and the NPRM.

2.2. Time Period of Analysis

- PHMSA evaluates all benefits, costs, and economic impacts over a 10-year period, from 2020 to 2029.
- PHMSA presents all estimates in 2019 dollar-years, and reports annualized and net present values using three percent and two percent discount rates.

3. Regulatory Impact Analyses by Amendment

3.1. Vessel Amendments

3.1.1. Section 171.22 Shipping Paper Accessibility

The baseline for the first of the proposed vessel amendments is that certain ports are not providing shipping papers to inspectors conducting container inspections in a timely manner. These ports appear to have the capacity to provide shipping papers more promptly because, according to USCG personnel, when there is evidence of release of material, such as odor, fumes, or leaking liquid, these ports are capable of providing shipping papers for the affected container very

[2] See 58 FR 51735, October 4, 1993 for Executive Order 12866.
[3] See 76 FR 3821, January 21, 2011 for Executive Order 13563.
[4] See 77 FR 28467, May 10, 2012 for Executive Order 13610.
[5] See http://www.dot.gov/regulations/dot-retrospective-reviews-rules for DOT Retrospective Reviews of Rules.
[6] See 5 U.S.C. 553.

promptly. However, for routine inspections where no leak or other evidence of material release is present, inspectors often have to wait up to 24 hours to receive shipping papers. This can delay completion of inspections, though in some cases inspection personnel can implement workarounds that mitigate the impact on the time wasted waiting for shipping papers.

Therefore, PHMSA proposes to revise § 171.22(f)(4) to require anyone that offers, stores, handles, or transports hazmat shall have shipping papers readily accessible for inspection to an authorized official of a federal, state, or local government. As mentioned, USCG inspectors have to wait up to 24 hours at certain ports for personnel to produce shipping papers for the inspected containers. This delays inspections, can waste USCG inspector time, and results in longer than necessary time frames for completing inspections. The current regulations require ports to "maintain a copy of the shipping paper or an electronic image thereof that is accessible at or through its principal place of business." PHMSA proposes to specify that the shipping papers be "readily accessible" to inspectors to address these concerns.

There are 361 regulated 33 CFR facilities that may be affected by this change as they represent the number of individual facilities (i.e. terminals) where packaged hazmat is moved and where the inspections would occur.[7]

It is PHMSA's understanding that some companies can produce shipping papers immediately and others take a longer period of time, even within the same port, due to their business practices. For instance, the shipping papers may be sent to their terminal representative(s) ahead of the arrival of the vessel, or they may be sent after the vessel arrives and is unloading. Therefore, PHMSA expects there may be costs to the industry associated with this proposed provision due to a possible disruption in the business and operating practices of the ports undergoing container inspections. In addition, the terminal representatives may have to make changes to be able to produce the shipping papers readily accessible to inspectors. Unfortunately, PHMSA cannot quantify these costs due to the lack of data, insufficient knowledge of standard port operating procedures, and lack of a clear understanding of the barriers to timely provision of shipping papers and what would be required to address the problem.

Anecdotal input from USCG container inspectors is that the time for the port personnel to provide shipping papers for containers containing hazardous materials varies by line and is not always consistent for larger or smaller ports. The terminal representatives sometimes print the shipping papers for the specified containers and provide them within minutes, whereas other times terminal representatives e-mail them to USCG inspectors hours later and after the inspectors' departure from the port.

USCG inspectors request shipping papers typically because of noted deficiencies with the container or issues with goods within the container, or they are being reviewed just to confirm what was seen during the inspection (i.e., essentially verification that the shipping papers match what was in the container even if there were no deficiencies). When the inspectors request shipping papers from the terminal representatives, they also inform them of any deficiencies. Depending on the severity of the deficiency, the container cannot continue to be

[7] https://www.ecfr.gov/cgi-bin/text-idx?SID=8112c32bcdce70d35084d82f0ef96655&mc=true&node=pt33.2.126&rgn=div5

moved in commerce until the issue is rectified. The sooner the shipping paper is made available, the sooner one aspect of a deficiency can be resolved. Depending on the findings during inspections, USCG inspectors may wait in the office of the terminal representative to receive the requested shipping paper or return to the USCG office. In either case, they will continue to request the documents at regular intervals if they have not been provided. Should it take more than 24 hours, it will often result in additional action.

USCG submits the results of container inspections to the International Maritime Organization (IMO). In 2019, there were 29,098 container inspections.[8] However, neither USCG nor PHMSA are able to identify the number of ports where delays in shipping paper availability were an issue, or how long, on average, those delays were. Neither USCG nor PHMSA can estimate how those delays impact the total length of time it takes for USCG personnel to complete inspections at a port. As a result, PHMSA cannot produce a reliable estimate for the amount of time and resources currently expended, in excess of those that would be expended if shipping papers were more readily accessible. Neither USCG nor PHMSA can produce a monetized estimate of the costs imposed or savings that might accrue with more readily accessible shipping papers.

However, PHMSA and USCG have determined that the current shipping paper availability requirements in § 171.22(f)(4) create unnecessary delays during container inspections in port areas. Therefore, the proposed revision to paragraph (f)(4) will more clearly indicate USCG's expectation that shipping paper information be provided immediately to inspectors or other designated individuals during container inspections. This proposed change is intended to increase safety by improving the ability of inspectors to conduct their reviews of hazardous materials shipments and increase efficiency by returning containers to commerce more quickly.

3.1.2. Section 171.23 "RQ" Marking

3.1.2.1. Proposed Rule Requirements

PHMSA proposes to revise § 171.23(b)(5)(iii) and clarify that the letters "RQ" (which indicates the presence of a § 172.101 Appendix A hazardous substance) and the name of the hazardous substance must only be marked on non-bulk packages containing a hazardous substance. Section 171.23 establishes HMR requirements for specific materials and packagings transported under the International Civil Aviation Organization Technical Instructions, IMDG Code, Transport Canada Transportation of Dangerous Goods Regulations, or the International Atomic Energy Agency Regulations. The HMR does not currently require this marking on bulk packages (see § 172.324). However, PHMSA and USCG understand that international shippers occasionally misinterpret § 171.23(b) as requiring this marking on bulk packagings. This change would eliminate the ambiguity and clarify that the "RQ" mark is only required for non-bulk regulated quantities.

[8] https://www.dco.uscg.mil/Portals/9/CG-FAC/Documents/Year%20in%20Review/CG-FAC%20YearInReview%202019_Final.pdf?ver=2020-05-21-081529-687

3.1.2.2. Baseline and Assumptions

To establish a baseline for this amendment, PHMSA developed its best assessment of conditions absent in the regulatory action. The regulatory changes in this instance affect international shippers of bulk packages of hazardous materials by vessel. As noted above, PHMSA and USCG understand that international shippers of hazardous materials by vessel occasionally misinterpret § 171.23(b) as requiring this marking on bulk packagings.

The proposed change will provide clarification to U.S. transporters of hazardous materials in bulk packaging by vessel. Firms that own and operate vessels capable of moving freight by water are contained in one of three industrial classifications:

- **Deep Sea Freight Transportation** industry (North American Industry Classification System (NAICS) 483111): Establishments engaged in providing deep sea transportation of cargo to and from foreign ports.
- **Coastal and Great Lakes Freight Transportation** industry (NAICS 483113): Establishments providing water transportation of cargo in coastal waters, on the Great Lakes System, or deep seas between ports of the U.S., Puerto Rico, and U.S. island possessions or protectorates.
- **Inland Water Freight Transportation** industry (NAICS 483211): Establishments engaged in inland water transportation of cargo on lakes, rivers, or intra-coastal waterways (except on the Great Lakes System).

As summarized by Exhibit 3 below, based on 2017 U.S. Census County Business Patterns data, there are 1,171 establishments in these three industries who may be affected by this action.

Exhibit 3. Affected Industries and Number of Affected Entities - Vessel

NAICS Code	Name	Description	Est. Business Entities
483111	Deep sea freight transportation	Establishments primarily engaged in providing deep sea transportation of cargo to and from foreign ports.	276
483113	Coastal and great lakes freight transportation	Establishments primarily engaged in providing water transportation of cargo in coastal waters, on the Great Lakes System, or deep seas between ports of the U.S., Puerto Rico, and U.S. island possessions or protectorates.	581
483211	Inland water freight transportation	Establishments primarily engaged in providing inland water transportation of cargo on lakes, rivers, or intracoastal waterways (except on the Great Lakes System).	314
		Total:	**1,171**

Source: U.S. Census 2017 SUSB Annual Data Tables by Establishment Industry Statistics reports the number of firms, employees, and revenues for six-digit NAICS industries across a range of employment size categories: https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html.

3.1.2.3. Analysis of Costs savings

Currently the regulatory text in § 171.23(b)(5)(iii) could be interpreted as requiring both bulk and non-bulk packages of hazardous materials to be marked with "RQ". The proposed amendment may result in cost savings for the affected entities if it reduces or eliminates the application of an "RQ" mark on a bulk shipment of hazardous materials. However, neither USCG nor PHMSA can produce an estimate of the number of bulk shipments to which the "RQ" mark is erroneously applied. As a result, PHMSA and USCG cannot produce an estimate of the monetized impact that might result from the proposed clarification of the regulatory text.

3.1.3. Section 172.504 "DANGEROUS" Placard Prohibition

Section 172.504 prescribes the general requirements for placarding hazardous materials in transportation. PHMSA proposes to revise paragraph (b) to no longer permit the "DANGEROUS" placard to be used for hazardous materials transported by vessel, thereby requiring the container to have a placard to specify each hazardous materials class packed in the container.

There are 1,171 establishments in the vessel industries that may be affected by this action, as shown in Exhibit 3 above. Currently, the "DANGEROUS" placard may be used when shipping non-bulk hazardous materials by vessel domestically. Use of the "DANGEROUS" placard is not allowed for international shipments as the placard is not recognized under the IMDG Code. However, PHMSA and USCG expect that the use of the "DANGEROUS" placard is confusing for vessel operators, even when used domestically, as it is not aligned with the IMDG Code, and does not provide adequate information on the hazardous materials inside the container for emergency response on board vessels.

This proposed provision could increase costs for shippers who exclusively move hazardous materials by vessel domestically. The change would require freight containers transporting non-bulk packages of multiple hazardous material classes to have multiple placards—one for each type of the hazardous material class packed in the mixed freight container instead of using the currently allowed "DANGEROUS" placard. PHMSA and USCG expect that, at a minimum, there would be placards for two different types of hazardous materials. Section 172.504(b) specifies that the "DANGEROUS" placard can currently be used when two or more categories of hazardous materials require different placards. For instance, a container with the "DANGEROUS" placard would have four placards (one on each end and one on each side). At a minimum, for two types of hazardous material classes packed in the mixed freight container, this proposed provision would increase the number of placards to eight.

International vessel operators conform with the IMDG Code and already provide complete placarding for all the hazardous material classes inside the container for emergency response on board vessels. This proposed provision could potentially eliminate the "DANGEROUS" placard for those who ship mixed freight containers domestically and impose costs by requiring placarding for all the hazardous materials in a container that moves by vessel.

PHMSA and USCG do not have data available to estimate the affected number of mixed freight, non-bulk hazardous material shipments by vessel domestically and, unfortunately, could not quantify the cost associated with this proposed provision. The most likely scenario for a

"DANGEROUS" placard to appear on a vessel is the instance of a truck shipment of mixed hazardous material classes making a water crossing via ferry. However, PHMSA and USCG expect that use of the "DANGEROUS" placard on freight containers is very rare for vessel transportation, and the cost would be incurred only in rare occasions when this placard would be eliminated and replaced with separate placards for each of the hazardous material classes packed in the mixed freight container.

PHMSA reviewed past incidents involving mixed freight of non-bulk packages of hazardous materials transported by vessel to determine how many might have been affected by this provision. PHMSA reviewed incidents from 2008 to 2019, in which a Hazardous Materials Incident Report, DOT Form 5800.1, was submitted. PHMSA identified a total of 25 incidents involving non-bulk packages of hazardous materials transported by vessel. PHMSA determined that 22 of 25 incidents involved undeclared shipments, or those without labels, markings. or placards on packages containing hazardous materials. The other three incidents would not be affected by this proposed provision. PHMSA anticipates that aligning the HMR with the IMDG Code to remove authorization to use the "DANGEROUS" placard for vessel transportation would result in harmonization-related benefits because greater consistency between national and international hazardous materials transportation regulations allows affected industries to avoid costs associated with changing shipments prior to movement (e.g., changing placards). In addition, greater efficiency and reduced time delays during the transportation process may enable the material to arrive at the final destination sooner.

3.2. Motor Carrier Amendments

3.2.1. Motor Carrier Executive Summary

PHMSA and FMCSA have proposed a number of amendments governing motor carrier CTMV training, inspection, and maintenance requirements. The purpose of these proposed amendments is to enhance the safe transportation of hazardous materials by highway while providing greater clarity and regulatory flexibility. PHMSA has assessed the proposed changes and identified four that merited assessment in the PRIA. Of these four, there were two for which economic impacts could be quantified.

The first change that PHMSA was able to quantify is an exception to placarding requirements for CTMVs that haul petroleum distillate fuels. At present, cargo tanks transporting only one petroleum distillate fuel must placard exclusively for the material contained in the cargo tank. The proposed exception would allow the cargo tanks transporting petroleum distillate fuels to placard for the lowest flashpoint material carried by the cargo tank in the previous or current business day. This exception primarily would apply to trucks hauling gasoline and diesel fuel; a cargo tank that hauls both a load of gasoline and a load of diesel fuel in the previous or current business day would be allowed to placard only for gasoline even when diesel is the only material being hauled.[9] This

[9] Technically, a petroleum distillate fuel includes hazardous materials beyond diesel fuel and gasoline. For example, kerosene and fuel oil/home heating oil are also petroleum distillate fuels that may be commonly transported under this exception. However, PHMSA expects the vast majority of petroleum distillate fuels moved per year are diesel and gasoline. Fuel oil is virtually indistinguishable from diesel fuel, and kerosene is a lower flashpoint combustible liquid.

saves the driver and company from having to change the placards on the vehicle when the commodity being hauled changes within the timeframe of the proposed exception.

Such an exception is already allowed for multi-compartment CTMVs hauling multiple petroleum distillate fuels in the same load. These cargo tanks can placard only for the lowest flashpoint material even if they are carrying, for example, a mixed load of both diesel and gasoline in separate compartments. PHMSA proposes to extend this exception to single-unit cargo tanks or multi-compartment tanks that make single commodity runs (i.e., they fill all compartments with either gasoline or diesel rather than a mixed commodity run where they carry both commodities). Flammable liquids are generally hauled in either an MC 306 or DOT Specification 406 CTMV. Most of these cargo tanks are multi-compartmented, but it is common for a cargo tank to be filled with a single commodity—either gasoline or diesel fuel—depending on demand.

The second proposed change that is assessed here would require bonding and grounding for cargo tanks hauling combustible liquids or flammable liquids that have been reclassified as combustible liquids. Bonding and grounding are currently required for cargo tanks loading or unloading flammable liquids, but are not required for those loading or unloading combustible liquids or flammable liquids reclassified as combustible liquids. The proposed change would require bonding and grounding for combustible liquids and flammable liquids reclassified as combustible liquids during the transfer of material to or from a transportation packaging.

In addition to these two items, several other proposed changes are discussed qualitatively and described as a clarifying or editorial amendment rather than new regulatory requirements. In a few cases, potential cost or cost savings impacts are described qualitatively because data limitations and information gaps prevent quantification without forthcoming new information. PHMSA presents a summary of costs, cost savings, and benefits for the quantified provisions in Exhibit ES-MC1 below. Note that net cost savings are cost savings plus benefits minus costs.

Exhibit ES-MC1. Costs, Benefits, and Cost Savings - Highway

	Bonding and Grounding (cost)	Bonding and Grounding Benefits	Placarding Exception Cost Savings	Net Benefits
2% Discount Rate	$4,571,944	$11,705,650	$807,539,892	$814,673,599
3% Discount Rate	$4,483,284	$11,116,129	$766,870,458	$773,503,303

3.2.2. Proposed Requirements

The proposed requirements governing motor carrier amendments are described above in Exhibit 2. Proposed changes in part 171-178 include:

- an IBR update of industry standards;
- an exception for placarding requirements for CTMVs hauling petroleum distillate fuels;
- an exception for certain hazmat employees from security awareness training;
- a requirement for bonding and grounding for cargo tanks hauling combustible liquids or flammable liquids reclassified as combustible liquids;
- post weld heat treatment of nurse tanks during manufacturing; and
- a requirement for remote emergency shutoff systems to retain lading if they fail.

Part 180 proposed changes include:

- requiring that cargo tanks with manual remote shut off valves be inspected to ensure the remote shutoff valve is not obstructed;
- a requirement that all equipment used to inspect cargo tanks be properly calibrated;
- an allowance for use of video or fiber optic equipment for inspecting cargo tanks;
- a requirement that all cargo tanks pressure tested at 50 PSI or greater be tested hydrostatically;
- a requirement that a registered inspector verify whether any corrosive or reactive has been shipped in a cargo tank prior to inspecting that tank;
- a requirement that cargo tank inspections include the pad attachments on either the tank shell or head;
- an exception from requiring the upper coupler to be removed during inspection; and
- a requirement that the CT number of the test facility be marked on the cargo tank.

Together, these requirements affect the manufacturing standards to which cargo tanks are built; the training of cargo tank manufacturing employees; the removal of decertified cargo tanks from service; modifications to cargo tank shutoff valves; and cargo tank inspection elements and protocols.

3.2.3. Baseline and Assumptions

The baseline assumptions are described above in Exhibit 2. The baseline consists of current regulatory requirements and industry practices. In some cases, current industry practices go beyond the bare minimum required by regulation. In these cases, the regulations are being changed to match industry practice, but the baseline assumption is that this change would impose no additional cost in cases where industry compliance with the new standard is already universal. However, such regulatory changes are in some sense beneficial because they ensure that any new entrant to an industry would meet the existing industry standards since they would be codified in

regulation. In this sense, they ensure ongoing industry compliance with said standards in perpetuity, or until further changes are made to the regulations in question.

In other cases, the changes proposed merely clarify existing regulatory requirements. The intent is not to impose new regulations, but to make the regulations clearer and easier to understand. This clarity prevents confusion and enhances compliance, which is beneficial in and of itself. Easier comprehension of regulatory requirements enhances efficiency because regulated entities can better understand technical specifications, performance standards, and other requirements. It also minimizes instances of affected entities being cited for violations because of confusion or a lack of understanding of what the regulations require.

Finally, there are cases where the regulations are being changed to enable new technologies or to address a safety vulnerability. In these cases, costs are either reduced by facilitating the use of new technologies, improving efficiency, or creating benefits by elevating the regulatory baseline in ways that prevent the release of hazardous materials into the environment and the deaths, injuries, and environmental damage that potentially ensue from such releases. In assessing the costs or cost savings of these proposed amendments, PHMSA takes industry current practice as the baseline and attempts to predict how the industry will change these baseline practices in response to the proposed regulatory change. Once the change in baseline behavior is understood, PHMSA attempts to monetize the value of the change where data availability and other information sources make that feasible. The following section provides the analysis of each motor carrier provision, assesses whether it has an economic impact, and if so, produces a quantified estimate of that impact, where feasible. Where PHMSA is uncertain as to whether the change would have an impact, PHMSA asks for public comment on that specific provision, including a description of the impact and, if feasible, the information necessary to assess the impact.

3.2.4. Regulatory Impact Analysis for Motor Carrier Amendments

3.2.4.1. Section 171.7 Incorporation by Reference Documents

In the accompanying NPRM, PHMSA proposes two updates to documents incorporated by reference into the HMR. First, PHMSA proposes an editorial revision to ASTM D 1835-97 Copper Strip Corrosion by Liquefied Petroleum (LP) Gases, 1964,[10] which is incorporated in § 171.7(h)(39). The proposed update would make an editorial revision to specify that this document was reapproved in 1968; PHMSA does not propose to change the current IBR standard in § 171.7. The other document is the CGA Technical Bulletin TB-2, Guidelines for Inspection and Repair of MC-330 and MC-331 Cargo Tanks, 1980, which is incorporated in paragraph (n)(21) of § 171.7. The proposed change would replace the 1980 version with the 1997 edition.[11] The 1997 version is titled "P-26: Guidelines for Inspection and Repair of MC-330 and MC-331 Anhydrous Ammonia Cargo Tanks (formerly TB-2)."

PHMSA technical staff have reviewed both documents and do not expect the updated version will impose any significant economic burden on the industries affected. However, these documents are technically complex, and it is possible that PHMSA has missed something that might have

[10] Available online at https://www.astm.org/Standards/D1838.htm.
[11] Available online at https://portal.cganet.com/Publication/Index.aspx?mode=keyword&param=130.

unanticipated impacts. PHMSA therefore asks affected entities for comments on the potential impacts of incorporating by reference the newer versions of the CGA document into the HMR. PHMSA asks that commenters provide a detailed description of the nature of the impacts, if any, along with any information that would enable PHMSA to estimate, monetize, or otherwise document these impacts.

3.2.4.2. Section 172.336 Relief from Cargo Tank Markings for Petroleum Distillate Fuels

This section considers the impact of allowing placarding of CTMVs that carry multiple shipments of different petroleum distillate fuels—primarily gasoline and diesel fuel—in the previous or current business day to placard for only the lowest flashpoint material carried that previous or current business day. PHMSA had a longstanding exception that allowed this practice but, through rulemaking changes and a letter of interpretation, the exception was inadvertently eliminated. As a result, CTMVs that carry both diesel fuel and gasoline in the previous or current business day must change their placards to reflect the material actually being carried. Prior to the change, these vehicles could have placarded for gasoline, which has a lower flashpoint than diesel, and been in compliance with marking requirements even if the vehicle made a trip carrying diesel fuel.

PHMSA does not expect this exception poses a safety risk; PHMSA notes that the emergency response procedures identified in the Emergency Response Guidebook for diesel fuel and gasoline are the same, and gasoline, because it has a lower flashpoint, is more easily ignited. Thus, in an emergency response situation, the crew responding to an incident may not respond any differently to a spill involving gasoline than a spill involving diesel fuel. The placard for gasoline therefore conveys the appropriate hazard information that determines the response to the incident. PHMSA seeks comment from the emergency response community to provide additional information on whether there are different emergency response procedures for gasoline compared to higher flashpoint petroleum distillate fuels such as diesel fuel.

Section 172.302 mandates marking the UN identification number of the material being hauled for bulk packages of 1,000 gallons or more. CTMVs fit that definition, and, unless subject to an exception, are generally required to display the UN identification number of the commodity being transported on both sides and both ends of the cargo tank. This means there are a total of four UN identification numbers on each cargo tank. In accordance with § 172.332, the UN identification number must be displayed in a placard, orange panel, or white square-on-point. The transportation hazard communication industry manufactures “flippable" (or flip) placards for the purposes of enabling a change in the UN number or commodity without removing one placard and replacing it with another.

Cargo tanks with multiple compartments that haul both gasoline and diesel fuel are relatively common and qualify for an exception that enables them to placard for only the lowest flashpoint material contained in the cargo tank when carrying a mixed load of both diesel fuel and gasoline. Put another way, under current regulations, if one compartment is filled with gasoline and others are filled with diesel fuel on the same delivery run, the carrier could placard only for gasoline. However, if all compartments were filled with diesel fuel, the carrier would have to placard for diesel fuel, and then change the placard to gasoline if a second run that day was made with gasoline in one or more compartment. The proposed change would enable an exception for single-compartment cargo tanks; if these tanks haul two petroleum distillate fuels in the previous or

current business day, they can placard for only the lowest flashpoint material transported that previous or current business day.

PHMSA assumes that all cargo tanks that transport multiple commodities contain flip placards that enable the displayed UN number to be changed relatively quickly and easily, since the previous exception for placarding for the commodity carried has been non-existent for some time. Gasoline is hauled under UN1203. Diesel fuel can be hauled either under NA1993 or UN1202. According to FMCSA data, there are approximately 98,548 CTMVs that haul flammable liquids.[12] FMCSA could not identify those CTMVs that haul petroleum distillate fuels vs other flammable liquids, so PHMSA used the ratio of ton miles of all Class 3 hazardous liquids hauled by truck[13] to ton miles for the following specific petroleum distillate commodities hauled by truck: UN 1203 – Gasoline; UN 1202 – Diesel Fuel; UN 1223 – Kerosene; UN 1863 – Aviation Fuel; and UN 1993 Flammable Liquids n.o.s including diesel fuel and fuel oil.[14] These commodities made up approximately 78.7 percent of flammable liquid ton miles according to the 2017 Commodity Flow Survey. Multiplying this percentage by the total number of CTMVs hauling flammable liquids (98,543) yields an estimated 77,549 that haul petroleum distillate fuels and therefore might be eligible to use the placarding exception.

FMCSA was also able to estimate that 10,934 cargo tanks haul combustible liquids but never haul lower-flashpoint flammable liquids, like gasoline. PHMSA assumes an equivalent number of vehicles may be dedicated solely to hauling flammable but not combustible liquids. Subtracting these cargo tanks from the total, on the assumption that they would never have to change placards because they only ever haul one commodity, leaves an estimated 55,681[15] CTMVs that haul both commodities and may therefore have to change placards with unknown frequency.

As noted above, under a currently existing exception, a cargo tank hauling a mixed load of both diesel fuel and gasoline would only have to placard for gasoline. Obviously, this cargo tank would not have to change placards to make a single commodity run with only gasoline in the cargo tank. However, were this CTMV to haul a load that was all diesel fuel, the placards would have to be changed. This amendment proposes to allow the cargo tank to placard for gasoline even though diesel fuel is being hauled.

PHMSA has very limited information on how often cargo tanks currently have to switch placards under this scenario. The Petroleum Marketers Association of America (PMAA) conducted a survey of Minnesota motor carriers to identify how many cargo tanks might be affected by the placarding requirement. The information provided is of limited use in identifying how many CTMVs would be required to change placards per day as the survey did not ask this particular

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[12] This figure was obtained via a specialized data query of FMCSA's motor carrier registration database.
[13] See CFS Table cf1700h07 at https://data.census.gov/table/CFSHAZMAT2017.CF1700H07?q=cf1700h07&nkd=HAZCLASS~30. This table shows Flammable liquid ton miles by truck at 86,385 in 2017.
[14] See CFS table cf1700h11 at: https://data.census.gov/table/CFSHAZMAT2017.CF1700H11?q=cf1700h11&hidePreview=true, which shows truck ton miles by UN number. Estimated ton miles for specific commodities, in millions, include UN 1202 – 9,708; UN 1203 – 33,803; UN1223 – 47; UN 1863 – 1,817; UN 1993 – 22,603. Total ton miles in millions for these specific petroleum distillate commodities total 67,978. 67,978/86,385 = 78.6919 percent.
[15] 77,549 – 21,868 (10,934 x 2) = 55,681.

question and was conducted for only one state. It seems unlikely that operations of the gasoline and diesel fuel delivery network would differ dramatically by state, but a broader survey would produce more reliable estimates. However, at one point the PMAA states the following:

> "There are anywhere from 4 to 10 placards on a typical cargo tank/transport trailer. It is estimated that the time needed to change all placards between loads would be between 10 and 15 minutes. At four loads per day, the total time spent per driver changing placards would be approximately one hour."

The estimate of 15 minutes to change placards and four loads a day is consistent with an hour of labor time, but it is not clear that this estimate is representative of the industry as a whole. A cargo tank that hauls a mixed load or one hauling only gasoline would not have to change placards. Only when a load of diesel fuel is hauled after a mixed or gasoline-only load would the driver have to change placards. Placards would have to be changed back if the next load the cargo tank hauled included gasoline as part or all of the payload. It seems unlikely that every cargo tank would require four placarding changes per day. PHMSA uses the following to obtain an estimate of the cost savings associated with the exception to placarding for diesel:

- Number of cargo tanks affected: 55,681
- Average number of placarding changes per day: two
- Percent of cargo tanks changing placards: 50 percent
- Time to change placards: 10 minutes, or .1667 hours
- Loaded commercial driver wage rate: $37.26 per hour[16]
- Cargo tank average operating days per year: 260

Given these assumptions, the estimated cost savings associated with the proposed amendment are approximately $89.9 million per year.[17] PHMSA and FMCSA seek comment on the accuracy of the assumptions made above to obtain this estimate. As noted above, this amendment is not expected to result in any decrease in safety performance; this same exception was in place for many years (from 1980 to 2015) without any evidence that safety was affected. The emergency response to a crash or other incident involving diesel fuel may be identical to that involving gasoline. PHMSA therefore does not expect that reinstatement of this allowance as proposed in the accompanying NPRM would pose any safety hazard and would be of substantial benefit to the segment of the motor carrier industry that hauls petroleum distillate fuels.

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[16] Wage obtained from BLS Occupational Employment Wage Statistics, May 2022 at https://www.bls.gov/oes/current/oes_nat.htm#53-0000. Base wage rate of $25.52 for heavy truck/tractor trailer drivers. This base wage was inflated to account for non-wage benefits, based on "total compensation" divided by "wages and salaries" for private industry workers in transportation and material moving occupations for March 2023. These values were taken from Table 4, page 7, of https://www.bls.gov/news.release/pdf/ecec.pdf, BLS's Employer Cost of Employee Compensation report. The calculation is: $33.13 in total hourly compensation divided by $22.72 in hourly wages = 1.46, multiplied by $25.52 = $37.26 per hour.

[17] 55,681 x 2 x 0.5 x 0.1667 x $37.26 x 260 = $89.9 million.

3.2.4.3. Section 172.704 Relief from Security Awareness Training for Manufacturers, Repairers, and Inspectors of Hazardous Materials Packages.

Employees involved in all segments of the hazardous materials supply and shipping chain must receive periodic specified training in safely packaging, handling, and transporting hazardous materials. One part of that requirement is for employees to receive general security awareness training every three years. This training is important because several classes of hazardous materials can be used to orchestrate harm to other humans or even for executing mass casualty events. It is therefore important for employees who package, handle, and ship these materials to maintain security awareness.

However, there are types of employees in the hazardous materials packaging supply chain who are unlikely to handle, package, or transport hazardous materials as a part of their job. These employees include those who manufacture specified hazardous materials packaging as well as those who test, inspect, requalify, or repair specified packaging. The HMR provides an exception for these employees from required hazardous materials safety training because they do not package, handle, or interact with hazardous materials and hence have no need to know how to handle these materials or respond to an emergency situation involving a release of hazardous materials. The HMR currently requires these employees to receive security awareness training; however, since unfilled or empty hazardous materials packages do not pose any particular security risk, it seems reasonable to except these employees from security awareness training under the logic by which PHMSA excepted them from safety training. Therefore, PHMSA proposes such an exception in this rulemaking.

Employees who manufacture, inspect, test, repair, recondition, or requalify packages work in several different manufacturing subsectors. Generally speaking, reusable containers fall into several different types: heavy gauge metal cylinders designed to contain pressurized gases such as oxygen and propane; truckload-sized cargo tanks and intermodal portable tanks; steel drums and other light gauge metal containers; plastic buckets, drums, and other plastic containers that are manufactured to UN dangerous goods specifications; and specialized bulk rail cars used to transport large quantities of various types of hazardous materials by rail. In addition, the types and configurations of disposable hazardous materials packagings are numerous, including paper products, paper sacks/envelopes, fiberboard boxes, and various types of plastic and metal containers.

Taken together, the manufacturers of disposable and reusable hazmat packages reside in several different segments of the manufacturing industry. PHMSA has examined the most detailed data available at the national level and concluded that it does not provide sufficient detail to estimate accurately the number of employees that might be affected by the proposed amendment. Specifically, PHMSA attempted to obtain an approximate estimate of the number of employees in the various manufacturing sectors that make hazardous materials packaging—i.e., those who may benefit from the exception from security awareness training—by using a combination of U.S. Census Bureau Economic Census and Bureau of Labor Statistics (BLS). The BLS data considered for use was the Occupational Employment Survey (OES). PHMSA explored the use of this data to estimate the number of employees who may no longer be required to obtain security awareness training with adoption of the proposed amendment; the employees' rate of pay; and the savings that may accrue from the proposed training exception. In making this attempt, PHMSA concluded

that the data are insufficiently detailed to allow a reasonably accurate estimate to be obtained. The methodology considered to obtain approximate estimates using these data are described further below using one example industry; namely, PHMSA discusses the attempt made for plastic container manufacturing to demonstrate the limitations of the data and why the data do not enable an accurate estimate of the number of employees affected by the proposed change.

1) Plastic Container Manufacturing

Plastic is a common material from which hazardous materials packaging is made. Plastic packaging comes in many forms and includes plastic bags, bottles, buckets, and drums among other configurations. As with other packaging materials, the requirements for plastic hazardous materials packages are set forth in the HMR and in the UN performance-oriented packaging specifications. The UN specifications require a series of tests appropriate to the packaging type to be conducted. Provided the packaging passes these tests, which may include leakproofness testing, drop testing, stack testing, etc., the packaging is approved for transporting classes of hazardous materials appropriate for its design and material.

PHMSA explored using a combination of data from the U.S. Census Bureau's Economic Census and BLS' OES to estimate the number of employees engaged in plastic hazardous materials packaging manufacturing who are subject to the security awareness training requirements, but would be excepted from those requirements with adoption of the proposed rule. PHMSA began by identifying the NAICS sectors engaged in plastic package manufacturing. The 4-digit NAICS code associated with plastics manufacturing is NAICS 3261 – Plastics Product Manufacturing.[18] There are a wide range of products made from plastics, only some of which are used in hazardous materials packaging. At the six-digit level, sub-sectors specifically associated with plastic package manufacturing can be identified. These include NAICS 326111 – Plastic Bag and Pouch Manufacturing; NAICS 326160 – Plastic Bottle Manufacturing; and NAICS 326199 – All Other Plastic Products Manufacturing. This last sector contains a more diverse range of containers, including plastic bins, buckets, and drums, among other products. However, note that the products the firms associated with these six-digit sectors manufacture are all fairly broad and not uniquely specific to packaging hazardous materials. For example, plastic bottles are sometimes used to package hazardous materials (e.g., household bleach), but are also used to package a wide array of non-hazardous items, such as fruit juices, popcorn, soda, and a wide array of other food and non-hazardous, non-food products. It is impossible to identify how many firms within these NAICS sectors manufacture hazardous materials packaging versus those that manufacture packaging and other products that are not used to package hazardous materials. This same shortcoming exists for the six-digit NAICS sectors associated with other package materials types, including metal containers; paperboard and fiberboard sacks, boxes, and containers; and glass and wood containers.

Furthermore, PHMSA would also need an estimate for the number of affected employees in specific occupations affected by the proposed amendment to estimate the number of affected

[18] U.S. Census Bureau; 2017 Economic Census, Manufacturing Tables https://data.census.gov/cedsci/table?hidePreview=true&table=EC1731BASIC&tid=ECNBASIC2017.EC1731BASIC&lastDisplayedRow=647&q=EC1731BASIC%3A%20Manufacturing%3A%20Summary%20Statistics%20for%20the%20U.S.,%20States,%20and%20Selected%20Geographies%3A%202017.

employees. Not all employees who work at a firm that manufactures hazardous materials packaging are required to obtain security awareness training; only those employees engaged in designing and manufacturing such packaging are required to take this training. Detailed employment by occupation are available at the four-digit NAICS level via the BLS OES.[19] This data is specific as to the types of occupations that might be afforded relief from security awareness training by the proposed amendment. Such occupations may include occupation codes: 17-2000 – Engineers; 17-3000 – Drafters, Engineering Technicians, and Mapping Technicians; 19-000 – Life, Physical, and Social Science Occupations; 27-1020 – Designers; and 51-0000 – Production Workers. The data for these occupations is available only at the four-digit NAICS level – Plastic Products Manufacturing, which is even less specific to hazardous materials packaging than six-digit level; as shown above, the six-digit level is not specific enough to identify employees associated with hazardous materials packaging design and manufacturing. Six-digit NAICS data provides total employment and number of firms in those sub-sectors, but still does not differentiate firms that manufacture hazardous materials packaging from firms that manufacture other products. Data that identifies occupations affected by the proposed amendment are available, but only at the even more aggregated four-digit level. Therefore, to use engineers as an example, a sub-set of engineers in the Plastic Products Manufacturing sector would be employed in designing hazardous materials packaging, and hence would be afforded relief from the required security training under the proposed amendment. However, neither the BLS nor the U.S. Census Bureau data produce a reasonable estimate of the number of engineers in the plastic products manufacturing sector who would be affected by the proposed amendment.

Given that the non-specificity in the plastic container manufacturing sector exists for other packaging material types, PHMSA concludes that the most detailed federal data identified is not sufficient to produce a reliable estimate of the number of affected employees in the various sectors who might gain relief from the current security awareness training requirement. PHMSA notes, however, that the requirement is not onerous; it consists of a 20-minute training module that is required once every three years. As a result, PHMSA is fairly confident that the relief provided by the proposed amendment would be modest for any affected firm and would not amount to an economically significant impact.

3.2.4.4. Sections 173.150 and 177.837 Bonding and Grounding Requirements.

The next amendment assessed in the PRIA proposes to require bonding and grounding of cargo tanks during the transfer of combustible liquids or flammable liquids reclassified as a combustible liquid. Such bonding and grounding is required for flammable liquids, but is currently not required for combustible liquids (flash point above 140°F and below 200°F) and flammable liquids reclassified as combustible liquids (flash point at or above 100°F and below 140°F).[20] A static electricity charge can occur when flammable or combustible liquids are transferred between a cargo tank and a storage tank. This charge can cause ignition of the material being transferred and cause a fire or explosion. Bonding and grounding prevent the buildup of static electricity during

[19] Bureau of Labor Statistics. 2018. Occupation Employment Statistics. May 2018 National Industry-Specific Occupational Employment and Wage Estimates. Available online at: https://www.bls.gov/oes/current/oessrci.htm.
[20] See § 173.120 for complete definition of combustible and flammable liquids reclassified as combustible liquids.

transfer of material and hence protect against the fire or explosion that might occur from the ignition of the material being transferred by electric charge.

1) Proposed Requirement

The accompanying NPRM proposes requiring bonding and grounding during transfer of combustible liquid and flammable liquids reclassified as combustible. As noted above, bonding and grounding during transfers to or from a CTMV of a flammable liquid is already required by regulation. The NPRM proposes to extend this requirement to flammable liquids with a flashpoints above 100°F (as they can be reclassified as combustible liquids) and at or below 140°F; and to combustible liquids with a flashpoint above 140°F and below 200°F. Common commodities that fall into this category include diesel fuel, fuel oil (also known as home heating oil), and some jet fuel. PHMSA and FMCSA expect that the vast majority of diesel fuel deliveries (used as motor fuel for diesel engines) would already be bonded and grounded. Most of these deliveries are made in multi-compartment combination CTMVs that haul both gasoline—a flammable liquid with a flashpoint where it cannot be reclassified as a combustible liquid—and diesel fuel; or in single-unit cargo tanks that may alternate between hauling diesel fuel or gasoline depending on demand. For either of these types of vehicles, bonding and grounding equipment would already be installed because it is required for any CTMV that hauls flammable liquids. Neither PHMSA nor FMCSA has much information regarding whether bonding and grounding during transfer of jet fuel is common practice. Bonding and grounding practices during home heating oil deliveries are also an unknown; it is possible that bonding and grounding is not practiced for these deliveries.

2) Cost Analysis

Bonding and grounding involve attaching a metal cable from the cargo tank to the tank receiving product from or supplying product to the cargo tank. The minimum equipment necessary to bond a tank to a CTMV is a conductive metal cable with alligator clips (the type used to jump start a battery). However, a loose, non-attached, cable can be lost, misplaced, or left behind, so most cargo tanks that haul flammable liquids have a self-retracting cable mounted to the cargo tank. Often, supply or receiving tanks will have such a cable spool permanently mounted as well. PHMSA and FMCSA obtained cost estimates for these self-retracting cable rota-reels that range in price from $140 for a 20-foot bonding and grounding cable rota-reel, to $363 for a 100-foot spool.[21] PHMSA uses the cost of a 50-foot rota-reel to estimate the costs of this provision, which is $336 per reel.

FMCSA queried their motor carrier database to identify those carriers who haul combustible liquids but do not haul flammable liquids or flammable liquids reclassified as combustible liquids. PHMSA assumes that carriers who haul both flammable and combustible liquids would use cargo tanks that are equipped with bonding and grounding equipment as this equipment would be required for delivering flammable liquids under current regulation. PHMSA requests comment on the accuracy of this assumption. The query for combustible liquids carriers returned 1,697 carriers that haul combustible liquids but do not haul flammable liquids. These carriers owned a total of

[21] See: https://www.jmesales.com/ametek-hunter-spring-rota-reel-static-grounding-bonding-reels-with-galvanized-steel-cable/. Accessed January 2020.

4,954 cargo tanks and 5,980 cargo tank trucks, for a grand total of 10,934 cargo tank motor vehicles. The estimated equipment cost for this provision is therefore 10,934 x $336, which equates to $3.67 million to outfit existing vehicles.

At each delivery, the CTMV driver would have to unspool and clip the cable to the receiving tank. This task would have to be conducted when the cargo tank returns to a supply location and refills for further delivery. The driver must also connect a hose from the tank truck to the supply or receiving tank and then transfer material from one to the other. PHMSA assumes that the relatively simple task of connecting the cable from one tank to another would not add appreciably to the time it takes to complete each delivery, and would not impose significant additional labor costs or affect delivery schedules. PHMSA, therefore, does not estimate any labor cost impacts associated with this task but seeks comment from the affected entities on whether this assumption is valid.

Every year cargo tanks undergo attrition from retirement due to age and are replaced by other cargo tanks. When this happens, the new cargo tank would have to be equipped with bonding and grounding equipment. Such equipment could be removed from the old tank, provided it is still in good working condition. Otherwise, new bonding and grounding equipment would have to be purchased to outfit new cargo tanks that replace the retired ones. PHMSA assumes an attrition rate of 3.3 percent of the initial year fleet annually (i.e., a flat 3.3 percent of 10,934 CTMVs, not a compounding percentage, or roughly 361 CTMVs per year), based on an estimated useful life of a cargo tank being roughly 30 years. This assumptions produce the following 10-year cost estimates (Exhibit 4), which account for tank attrition and industry growth, assuming each new tank must be equipped with bonding and grounding equipment at $336 per tank. The year one costs in Exhibit 4 below are the cost of equipping the existing fleet of cargo tanks as described above.

Exhibit 4. 10 Year Cost Estimate for Combustible Liquid Bonding and Grounding

Year	Replacement CTMVs	Cost	Incident Costs
1		$3,673,824	$1,303,149
2	361	$121,236	$1,303,149
3	361	$121,236	$1,303,149
4	361	$121,236	$1,303,149
5	361	$121,236	$1,303,149
6	361	$121,236	$1,303,149
7	361	$121,236	$1,303,149
8	361	$121,236	$1,303,149
9	361	$121,236	$1,303,149
10	361	$121,236	$1,303,149
	Total	$4,764,950	$13,031,494
	Present Value (2% discount rate)	$4,571,944	$11,705,650
	Present Value (3% discount rate)	$4,483,284	$11,116,129

3) Benefits Analysis

PHMSA queried its incident database to identify incidents in which a combustible liquid or flammable liquid reclassified as a combustible liquid may have been ignited by a static electricity buildup during the transfer of material to or from a CTMV from another vessel. The data query included the past 10 years. These data are presented in Exhibit 5 below. As can be seen, incidents involving ignition of combustible liquids during transfer of materials have occurred. The incident descriptions for these incidents all mention that the fire and/or explosion occurred during transfer of material and do not mention an obvious external ignition cause. Some mention static electricity build-up as a potential source of ignition. Though static buildup is not definitively known to have caused ignition in any of the incidents, it seems to be a likely cause of ignition given the absence of a visible ignition source. All the incidents included here involve fire or explosion, and one involved multiple injury. However, given the large number of deliveries of combustible liquids over the past 10 years, these events are relatively rare. Still, bonding and grounding could prevent such incidents from occurring in the future. These figures have been inflation adjusted using the BLS Consumer Price Index (CPI) calculator from the month in which they occurred to 2020 figures.[22] The inflation adjusted figures are presented in the final column of the table.

Exhibit 5. Combustible Liquid Ignition During Loading/Unloading

Commodity	UN Number	Date	Major Injuries	Minor Injuries	Quantity Released (gallons)	Reported Cost of Incident	Inflation Adjusted Cost
Diesel Fuel	1993	5/06/2020	0	1	247	$101,248	$153,176
Aviation Fuel	1863[23]	6/3/2019	1	3	3,140	$7,297,512	$7,344,634
Fuel Oil (#2 Heating Oil)	1993	1/31/2018	0	0	2,534	$1,300,000	$1,352,993
Diesel Fuel	1993	8/4/2016	0	0	2,500	$1,990,000	$2,147,556
Diesel Fuel	1993	8/5/2015	0	0	4,500	$349,130	$380,777

These incidents could potentially have been prevented with bonding and grounding of the cargo tank. Summing those costs for these four incidents yields an inflation adjusted total cost over 10 years of $13,031,494 . PHMSA used 10 years of incident data to calculate the costs of incidents, a period of time equivalent to the 10-year analysis period. It is reasonable to assume that incident frequency and severity would be equivalent in the 10-year analysis period to the incidents that occurred in the previous 10 years. This assumption would result in equivalent damages over the 10-year analysis period to those obtained from the historic incident data. With this assumption, estimated benefits exceed estimated costs for this proposal by roughly a factor of two.

[22] See: https://www.bls.gov/data/inflation_calculator.htm.
[23] UN 1863 is classified as a flammable liquid but PHMSA has issued an interpretation allowing it to be reclassified as a combustible liquid, which makes the incident applicable. See https://www.phmsa.dot.gov/regulations/title49/interp/17-0012.

3.2.4.5. Section 173.315 Nurse Tank Post-Weld Heat Treatment

PHMSA and FMCSA propose only one change in § 173.315 that is assessed in this PRIA. That change is the requirement that nurse tank welds be heat treated. Nurse tanks are used to contain, store, and transport anhydrous ammonia. Anhydrous ammonia is used extensively in the agricultural industry to fertilize fields. This commodity is toxic by inhalation, meaning that breathing anhydrous ammonia vapors can cause severe lung injury, up to and including death. Post weld heat treatment makes the failure of welds on these tanks less likely, and therefore enhances public safety. At present, FMCSA and PHMSA understand that all U.S. manufacturers use post weld heat treatment when manufacturing nurse tanks. As this proposal would not change industry practices, it is not regulatory in nature. The change, however, would make sure that any new entrant into the nurse tank manufacturing industry would also abide by this best manufacturing practice. Since this change is deemed to be non-regulatory, PHMSA does not assess costs or benefits associated with it. PHMSA seeks comment on any impacts that may arise from the adoption of this proposed amendment that are not apparent to PHMSA or FMCSA.

3.2.4.6. Section 180.405 Cargo Tank Remote Shutoff Systems

The next item for analysis is the § 180.405 requirement that cargo tank remote shutoff systems be inspected to ensure that no appurtenances or other components obstruct access to the remote shutoff system or interfere with its functioning. Sometimes cargo tanks are modified after manufacturing in certain ways that do not affect the integrity of the cargo tank or interfere in any way with its ability to hold lading, e.g., appurtenances added to the exterior of the cargo tank. FMCSA field inspection personnel, however, have seen cases where these appurtenances interfere with access to, or the operation of, emergency remote shutoff systems.

The remote shutoff systems enable closure of cargo tank valves during spills. One such case for the system is the release of product during the loading or unloading of a cargo tank. For instance, if the hose used to transfer material from the cargo tank to the receiving vessel ruptures or becomes disconnected during unloading, activation of the remote shutoff system can reduce the amount of product spilled. Such a spill can also occur if a receiving vessel is overfilled. In these situations, it is unsafe for the operator to approach the primary valve shutoff mechanism because doing so would expose them to direct contact with the hazardous materials spilling from the cargo tank. Instead, the operator would use the emergency remote shutoff system to close the valve from which product is spilling. Anything that obstructs or prevents access to, or activation of, this shutoff system would obviously make the spill worse by preventing access to the remote shutoff system.

If the proposed amendment is adopted, any appurtenance that obstructs access to or use of the emergency remote shutoff system on a cargo tank would have to be removed or moved to another location where it would not interfere with the remote shutoff system. This review would need to be conducted at the next inspection and before the cargo tank could be requalified at its next scheduled requalification inspection. Cargo tank operators could remove or move these appurtenances at the next requalification inspection, or anytime beforehand. PHMSA expects this would allow operators time to make such modifications at the most convenient time that would be least disruptive to operations. PHMSA therefore expects that the only cost associated with the

proposed provision would be the labor and any material costs associated with moving these appurtenances.

Unfortunately, due to several information gaps, PHMSA cannot estimate a cost for this requirement. While FMCSA inspectors have noted the problem of obstructing appurtenances, PHMSA and FMCSA cannot confidently estimate the prevalence of the issue, such as the number of cargo tanks that have appurtenances that obstruct or interfere with remote shutoff systems. In addition, neither PHMSA nor FMCSA have specific information on the cost of moving the obstructing appurtenances. However, FMCSA generally mandates that when remote shutoff systems are required, they should be visible and accessible to be effective. These systems serve an obvious safety purpose—to shut off valves that are releasing hazardous substances, thereby reducing the size of spills when some operational or component failure results in spillage from a cargo tank valve. PHMSA asks for comment on this provision and any information that would enable PHMSA to quantify and monetize the cost and safety impacts.

3.2.4.7. Section 180.407 Amendments

Section 180.407 lays out cargo tank requalification inspection requirements. For the most part, the provisions proposed in the accompanying NPRM merely clarify existing requirements rather than add new requirements or remove existing ones.

One of the items in this section would be a new regulatory requirement: Any cargo tank pressure tested at 50 PSI or higher must be tested using hydrostatic pressure, except MC 338 cargo tanks used to transport cryogenic material. Essentially, this provision eliminates the option of pneumatically pressure testing a cargo tank for those cargo tanks with a test pressure over 50 PSI.

Another proposed item facilitates the use of fiber optic and video equipment to inspect cargo tanks. This provision gives cargo tank inspection facilities the flexibility to use video cameras or fiber optic equipment to inspect visually the interiors or other hard to access areas of cargo tanks. At present, these areas must receive actual in-person visual inspection, meaning a person has to access the inspection point, including entering the interior of the cargo tank through a manway to inspect for weld condition, corrosion, and other issues. By allowing flexibility and potentially improving the efficiency of cargo tank inspections, this provision provides regulatory relief while also increasing safety.

The rest of the provisions in this section clarify or provide specific citations to already required inspection elements. Exhibit 6 below presents the changes proposed in this section of the HMR.

Exhibit 6. Proposed Changes in § 180.407

CFR Section	Description of Change
180.407(a)(7)	Add paragraph (a)(7) that all equipment and instruments required to be used for a function under subpart E must be calibrated in accordance with the manufacturer's instructions. The facility must retain appropriate records documenting the type of calibration, date calibrated, and by whom. The facility must retain a copy of the recent and preceding calibration documentation.
180.407(a)(8)	Add paragraph (a)(8) so that the use of video cameras or fiber optics equipment is authorized for any inspection or test, or portion thereof, provided all the required areas and elements can be viewed and evaluated according to this subpart. The use of such equipment shall be fully documented on the report required by § 180.417.
180.407(a)(9)	Add paragraph (a)(9) so that for any test or inspection that requires a cargo tank motor vehicle to be tested at a pressure higher than 50 psi, the hydrostatic method shall be used, except for MC338 cargo tanks used to transport cryogenic liquids.
180.407(a)(10)	Add paragraph (a)(10) so that the Registered Inspector shall consult with the cargo tank motor vehicle owner or motor carrier to determine if materials corrosive or reactive to the cargo tank or its components were transported in the cargo tank since the last test or inspection was performed. The Registered Inspector must document and use the information to conduct the proper test and inspections on the CTMV.
180.407(d)(2)(i)	Revise paragraph (d)(2)(i) to require all pad attachments that are attached to either the cargo tank shell or head shell be inspected during the inspection of cargo tank shell and heads.

1) Pressure Testing of Cargo Tanks (§ 180.407(a)(9))

The new proposed regulatory requirement (§ 180.407(a)(9)) would essentially disallow the practice of pneumatic testing of cargo tanks—other than MC 338 cargo tanks that are used to haul cryogenic materials—that are pressure tested at 50 PSI or higher. There are currently two technologies for pressure testing cargo tanks—hydrostatic and pneumatic testing. Hydrostatic testing is much more common and involves filling a cargo tank with water or other fluid until the required internal pressure is reached. Pneumatic testing involves pressurizing the tank with air or another gas to the specified PSI. If the proposed amendment is adopted, only hydrostatic pressure testing would be allowed for cargo tanks tested at 50 PSI or higher pressure.

There is a clear safety justification for restricting the use of pneumatic pressure testing. Cargo tanks pressurized pneumatically can rupture violently and spray shrapnel and cargo tank parts with violent force. Anyone within close proximity can be seriously injured or even killed by debris projected from the cargo tank. When a cargo tank being tested with hydraulic liquid fails, it may rupture, but it does not rupture violently. Restricting the use of pneumatic pressure testing, therefore, protects the health and safety of the employees of entities that conduct cargo tank pressure testing. Pneumatic testing is not permitted for requalification testing of smaller gas cylinders for this same reason. This change, if adopted, would therefore restrict the use of pneumatic testing for larger cargo tanks.

Neither PHMSA nor FMCSA has specific information on the degree to which pneumatic testing is used to pressure test CTMVs at 50 PSI or higher. However, given the inherent risk of this practice, PHMSA expects pneumatic testing is used infrequently. In addition, neither PHMSA nor FMCSA has any information on the cost differential between hydrostatic and pneumatic pressure testing of cargo tanks. It is unclear if the use of hydrostatic testing would be inherently more costly than pneumatic testing. Due to these information gaps, neither PHMSA nor FMCSA is able to estimate the costs, if any, associated with this provision. PHMSA and FMCSA seek comments on the prevalence of pneumatic versus hydrostatic pressure testing in the CTMV industry, and information on any cost differential that exists between the two methods to better quantify and monetize the impact of the proposal.

2) Use of Fiber Optic or Video Inspection (§ 180.407(a)(8))

The new proposed provision in this section would enable use of video or fiber optic remote viewing technology for inspecting cargo tanks during requalification inspections. Currently, cargo tanks must be visually inspected directly by human visual inspection. This change, if adopted, would enable remote inspection using high resolution video technology. Under current regulations, a human must enter a cargo tank via a manway to inspect the interior visually. With the adoption of this amendment, a device with video transmission capability (e.g., a camera attached to a fiber optic cable) could be used in concert with a video monitor or television to inspect the interior of the cargo tank without the need for a human to enter the tank.

Human entry into a cargo tank is not without hazards. In general, manway covers allowing entry are on the top of the cargo tank. Human entry requires ascending a ladder on the exterior of the cargo tank, traversing a portion of the concave top of the cargo tank, and descending through the manway cover to the bottom of the cargo tank. At any point, a slip or fall can result in injury. In addition, exposure to residual fumes or hazardous materials can cause human harm. Incidents of human injury could be reduced or eliminated by allowing remote video inspection of cargo tanks. In addition, such technology could potentially lead to efficiencies that lower the cost or increase the speed of cargo tank inspections.

Such efficiencies are expected to reduce costs for cargo tank owners and inspectors. However, neither PHMSA nor FMCSA is able to produce reliable estimates of the cost savings associated with video inspection of cargo tanks. PHMSA and FMCSA lack information on the amount of time that might be saved per inspection or other efficiencies that might result in reduced costs. Neither PHMSA nor FMCSA is able to estimate the number of facilities that might adopt this technology, and hence cannot estimate how many cargo tank inspections might be done more efficiently with the adoption of this proposed amendment. Therefore, PHMSA does not quantify cost savings associated with the amendment at this time and seeks public comment on the proposal.

3) Clarifying Amendments

The remaining proposed amendments codify specific requirements into the HMR that are currently considered to be components or subsets of existing general requirements, and therefore, are clarifying amendments. Any of these items, if observed during a compliance inspection, would result in a citation for a violation under existing regulations. These items therefore do not impose

new regulatory requirements. Instead, they clarify existing requirements by calling them out specifically in the HMR.

For example, if an FMCSA inspector observed out-of-calibration equipment at a cargo tank facility, the inspector would issue a citation to the general violation of "improperly qualifying cargo tanks." With the adoption of the proposed amendments, the citation would instead be to the specific requirement to maintain equipment in proper calibration. Likewise, if some defect was found in the void between the bulkheads on a cargo tank that had been requalified without repair of the defect, this same general "improperly qualifying" citation would be used to note the violation.

In addition, this rulemaking proposes that carriage of corrosive or reactive materials requires the RI to follow specific inspection procedures to ensure that the corrosive or reactive nature of the lading has not damaged the cargo tank in ways that could affect its integrity. While these procedures are not currently specified in the HMR, a cargo tank that has corrosion but has been requalified without inspecting whether the corrosion caused damage to the cargo tank's integrity would also result in a general "improperly qualifying" citation. Therefore, PHMSA also considers this proposed requirement a clarifying amendment.

More specific citations for specific errors in requalifying cargo tanks have benefits for both the entities that requalify cargo tanks and for PHMSA and FMCSA. Calling out specific inspection items highlights those items and ensures inspectors are fully aware those issues need to be addressed when requalifying a cargo tank. Such awareness is likely to result in fewer citations for failure to properly qualify cargo tanks because inspectors will be less apt to overlook these elements when conducting inspections. Citation for violations can disrupt the normal course of business and delay inspection and requalification of cargo tanks. Better familiarity and awareness of inspection elements can lead to fewer disruptions and more efficient operations.

For PHMSA and FMCSA, specific citations for not adhering to the regulatory code can have analytical benefits, leading to HMR improvements that enhance public safety and minimize regulatory burden. For example, if an element is not specifically listed in the HMR as part of an inspection (e.g., if inspecting a certain component is required but not listed as a requirement) a cargo tank facility that failed to inspect that component would be cited for a generic "failure to complete inspection" violation. If the HMR contains a more detailed citation for "failure to inspect component X," those violations can be linked to incidences of release to determine whether failure to inspect that component is associated with a greater likelihood of release or larger release quantities. The less specific citation may not enable a particular defect to be linked to such releases. Identifying the specific defect associated with a release, rather than a general citation, would enable PHMSA to identify and correct that safety deficiency. Conversely, if a specific citation is found not to be associated with hazardous materials releases, that could be evidence a particular citation could be amended to reduce the burden on industry without compromising safety. Without the ability to cite specifically to particular defects, such assessments are difficult.

3.2.4.8. Section 180.415 Cargo Tank Facility Marking

This section contains cargo tank marking requirements, which govern what markings must be applied to a cargo tank motor vehicle upon inspection and/or repair. Such markings include notations indicating the tests performed on the cargo tank to ensure it still meets all pertinent

qualifications and is in acceptable condition to continue in hazardous materials service. Cargo tank facilities that conduct these requalification inspections on CTMVs must register with FMCSA. Upon registering, these facilities are issued a unique registration number, known as a "CT number," which uniquely identifies the facility in the FMCSA database of registered facilities.

In the accompanying NPRM, PHMSA proposes to require that a cargo tank facility must mark each cargo tank inspected with its CT number. Marking with the CT number ensures that a PHMSA, FMCSA, or state inspector can readily identify the cargo tank facility that last inspected and requalified a CTMV, if necessary. Many cargo tank facilities already comply with this requirement. It is common in the industry for a cargo tank facility to apply a die cut sticker with the logo of the company, along with the address, phone number, e-mail contact information, and website URL. This is a regular business practice that reminds the owner of the CTMV which facility last inspected the CTMV, and indicates that the company in question offers that service. Oftentimes, this sticker contains the CT number for the facility.

This change is regulatory in nature because it requires a new marking. PHMSA estimated the compliance costs by obtaining information online about the cost of 4 x 6 inch, custom designed, die cut, weatherproof stickers. Such a sticker could be applied in seconds and would satisfy the marking requirement so long as it displays the CT number legibly. Cargo tank facilities that already have custom die cut stickers may not incur additional costs, providing they can alter their existing stock to add the CT number. The cost to make minor alterations to the existing sticker may be essentially zero, and PHMSA does not expect that the per-sticker cost would increase due to such a minimal change in design. These facilities could continue to use their existing stock in the interim between the final rule and the effective date for this provision, at which point they could order the new design that contains the CT number.

Cargo tank facilities that currently do not apply such a sticker would have to order die cut stickers to comply; therefore, there is a cost associated with these stickers. Based on the number of cargo tanks in operation and the number of cargo tank facilities, PHMSA estimates that each facility inspects, on average, approximately 61 cargo tanks per year. Thus, a supply of 100 stickers would be nearly a two-year supply, assuming each inspected cargo tank required a new sticker. Many CTMV owners use the same cargo tank facility for repeat inspections and if the sticker applied during the last inspection were still legible, the facility would not have to re-mark the CTMV as the required CT number marking would already exist on the CTMV.

PHMSA obtained cost estimates for custom designed die cut stickers from two online sources. The first company priced 125, 4 x 6 inch stickers at $136.25 (125 stickers x $1.09 per sticker). A second priced 100, 5 x 5 inch stickers at $90.12.[24] A year's supply of 61 stickers using the second quote would cost roughly $55, which PHMSA uses to estimate the yearly cost of this requirement. PHMSA expects the labor involved in peeling off and applying a sticker to a cargo tank would be too minimal to quantify but seeks comment on that assumption. An estimated 3,518 cargo tank facilities are currently in operation, so the annual cost of this requirement would be approximately

[24] See https://www.stickergiant.com/size-quantity,or https://www.bluebeeprinting.com/die-cut-stickers/?gclid=CjwKCAjwm_P5BRAhEiwAwRzSO1dpxKO-jFY_lti1THUbd1EgMbAATpV3U2uh5yW_H0zyDDiSpbnaRxoCtpUQAvD_BwE.

$193,000 if zero cargo tank facilities were currently applying stickers identifying the cargo tank facility by CT number. However, DOT inspection staff note that they commonly see such markings on cargo tanks despite the lack of a requirement to apply such markings. It seems reasonable to assume that some significant portion of the industry is already compliant with this requirement or could comply at essentially no cost. Unfortunately, PHMSA has no official data to estimate the rate of industry compliance, but assuming that 25 percent of cargo tank facilities are already applying identifying markings would reduce the above estimated annual cost to $145,000.[25] Given the uncertainty in the number of already compliant cargo tank facilities, PHMSA does not use this figure as a cost in the summary of costs and benefits. However, PHMSA notes that the cost is relatively trivial on a per-entity and aggregate basis, even if no cargo tank facilities are currently in compliance with the requirement.

3.2.5. Conclusion – Motor Carrier Amendments

This section summarizes the economic analysis of the motor carrier items included in the proposed rule. Costs, cost savings, and/or benefits could be quantified for two provisions: the placarding exception for flammable and combustible liquids, and the bonding and grounding requirement for combustible liquids and flammable liquids reclassified as combustible liquids. Exhibit 7 summarizes the costs, cost savings, and where applicable, benefits for these provisions. PHMSA also presents the net cost savings for the motor carrier provisions and net benefits for the bonding and grounding requirement. Note that net benefits are cost savings plus benefits minus costs.

Exhibit 7. Summary of Motor Carrier Costs, Benefits, and Cost Savings

Year	Bonding and Grounding Costs	Bonding and Grounding Benefits	Placarding Exception Cost Savings	Net Benefits
1	$3,673,824	$1,303,149	$89,900,612	$87,529,938
2	$121,236	$1,303,149	$89,900,612	$91,082,526
3	$121,236	$1,303,149	$89,900,612	$91,082,526
4	$121,236	$1,303,149	$89,900,612	$91,082,526
5	$121,236	$1,303,149	$89,900,612	$91,082,526
6	$121,236	$1,303,149	$89,900,612	$91,082,526
7	$121,236	$1,303,149	$89,900,612	$91,082,526
8	$121,236	$1,303,149	$89,900,612	$91,082,526
9	$121,236	$1,303,149	$89,900,612	$91,082,526
10	$121,236	$1,303,149	$89,900,612	$91,082,526
Total	**$4,764,950**	**$13,031,494**	**$899,006,123**	**$907,272,668**
NPV (2% Discount Rate)	**$4,571,944**	**$11,705,650**	**$807,539,892**	**$814,673,599**
NPV (3% Discount Rate)	**$4,483,284**	**$11,116,129**	**$766,870,458**	**$773,503,303**

[25] 3,518 cargo tank facilities x $55 x 0.75 = $145,000 rounded to the nearest thousand.

3.3. Railroad Amendments

In the NPRM and in conjunction with FRA, PHMSA proposes numerous HMR revisions. These proposed revisions are designed to provide greater clarity, facilitate understanding of rail carriage requirements, and remove regulatory barriers to efficient operation without diminishing safety.

The NPRM proposes to require written, reliable closure instructions for tank cars; revise OTMA requirements; and require registration of tank car facilities and tank car DCEs. It proposes removing the requirement for AAR TCC approval of tank car designs and replacing it with an approval by a DCE. It also proposes removing the requirement for AAR approval of the QAP for tank car facilities.

If the proposed amendments are codified in a final rule, railroads will realize cost savings due to fewer OTMAs as they would no longer be required for clean cars. Written closure and securement instructions would also reduce the number of OTMAs. Finally, tank car facilities and tank car manufacturers would save money because they would no longer need to have their facilities' QAPs and tank car designs approved by AAR. The total 10-year estimated cost savings would be $70.6 million. The discounted values are $64.6 million (two percent, present value (PV)) and $62.0 million (three percent, PV).

Exhibit ES-R1. Total 10-year Cost Savings - Rail

Category	Undiscounted	PV 2%	PV 3%
Fewer Cleaned and Empty OTMAs	$278,500	255,169	$244,693
Fewer OTMAs due to Closure Instructions	$21,973,566	20,132,702	$19,306,215
Tank Car Design Savings	$4,200,000	3,848,139	$3,690,166
QAP – No AAR Approval Required	$44,099,770	40,405,253	$38,746,538
Total	**$70,551,837**	**64,641,263**	**$61,987,612**
Annualized		**7,196,287**	**$4,166,541**

Additionally, PHMSA estimates that benefits will accrue due to fewer non-accident releases (NARs). The total 10-year estimated benefits of this proposed rule would be $6.2 million. The discounted values are $5.7 million (two percent, PV) and $5.4 million (three percent, PV), which are demonstrated in Exhibit ES-R2.

Exhibit ES-R2. Total 10-year Benefits - Rail

Category	Undiscounted	PV 2%	PV 3%
NAR	$6,200,000	5,680,587	$5,447,388
Total	**$6,200,000**	**5,680,587**	**$5,447,388**
Annualized		**632,400**	$366,150

Some costs will be incurred by industry to comply with this proposed rule. This includes costs of requiring tank car repair facilities and DCEs to register with PHMSA. Also, costs will be incurred by requiring offerors to document their closure and securement instructions for tank cars. Finally,

costs would be incurred by the requirement to have a tank car DCE certify tank car design. The total costs over 10 years would be $10.9 million. The discounted values are $10.3 million (two percent, PV) and $10.1 million (three percent, PV).

Exhibit ES-R3. Total 10-year Costs - Rail

10-Year Costs			
Category	**Undiscounted**	**PV 2%**	**PV 3%**
Facility Registration	$44,528	43,530	$43,080
DCE Registration	$6,250	6,110	$6,047
Closure and Securement Instructions	$7,339,526	7,087,083	$6,973,744
DCE Approval of Tank Car Design	$3,500,000	3,206,783	$3,075,138
Total	**$10,890,303**	**10,343,506**	**$10,098,010**
Annualized		**1,151,507**	**$678,745**

3.3.1. Introduction

The HMR currently delegates tank car design approval and tank car facility QAP approval to AAR TCC. AAR TCC is a body of representatives drawn from railroads, tank car shippers, and tank car manufacturers. PHMSA and FRA provide regulatory oversight to the AAR TCC process to ensure the committee is operating within the requirements of the HMR.

Recently, PHMSA and FRA initiated a review of the current requirements in Part 179 that require tank car design and tank car facility QAPs both be approved by AAR TCC. PHMSA and FRA expect that the current system requiring AAR approval for tank car designs and tank car facility QAPs is unduly burdensome for the regulated industry.

The NPRM proposes to remove AAR's authority to review and approve tank car and service equipment designs. In place of AAR's design review and approval of tank cars and service equipment, PHMSA proposes review and approval be conducted by a tank car DCE—who is registered with PHMSA—similar to a process already in use for CTMVs. PHMSA and FRA expect that a tank car DCE meeting the proposed § 171.8 definition would be able to review the design of a tank car or service equipment and determine whether the design complies with the requirements of Part 179. As mentioned, PHMSA and FRA will oversee DCEs through a proposed registration program. Requiring the tank car DCE to register with PHMSA gives PHMSA and FRA oversight over the tank car DCEs. It also allows them to trace design issues from a tank car facility back to the tank car DCE, and suspend or terminate their ability to operate for cause.

PHMSA and FRA also propose to remove the requirement for AAR TCC approval of QAPs. Currently, all tank car facilities must submit their QAP to AAR for approval, in accordance with § 179.7. The NPRM proposes to replace the current requirement with a requirement for tank car facilities to register with PHMSA. As proposed, tank car facilities must still develop and maintain QAPs that meet the requirements of § 179.7 and submit the executive summary of their QAP with their registration statement. However, PHMSA and FRA will oversee tank car facilities through the proposed registration program and compliance audits.

PHMSA and FRA expect that the requirement for AAR to review and approve each tank car facility's QAP creates an undue burden on the tank car facility and can create delays that hinder commerce. Requiring each facility to create and maintain a QAP that meets the requirements of § 179.7, and overseeing them through the proposed registration program and compliance audits would maintain an equivalent level of safety while reducing administrative burdens.

Through observations of the current AAR processes and procedures, PHMSA and FRA are concerned that the current system of AAR audits provides limited safety benefits compared to the burdens imposed. PHMSA and FRA expect the registration program—combined with regular compliance audits by government personnel—will maintain an equivalent level of safety to the current requirements while reducing administrative delays caused by the AAR process. PHMSA and FRA emphasize that adhering to a rigorous QAP is critical for a tank car facility to ensure the tank cars qualified for service at the facility meet the requirements of the tank car's specification and regulations.

3.3.2. Methodology of this Economic Analysis

The purpose of this PRIA is to estimate the impact of the proposed changes of the NPRM. Within the 10-year period of this analysis, costs are assessed in terms of changes to the current regulatory burden due to these rule changes. In economics, this type of analysis is referred to as a marginal analysis. Some of the changes in this proposed rule would result in additional regulatory burden, which would be more than offset by the cost savings of those provisions.

This PRIA adheres to methodologies described above. A few key assumptions in the analysis relevant to the assessment of the proposed rail amendments are presented here:

- All costs and benefits in this analysis are stated in 2022 dollar amounts unless otherwise stated.
- The first implementation year would be 2024.
- Wage rates are based on 2022 data.

3.3.3. Background—RSAC

RSAC is a Federal Advisory Committee established by the U.S. Secretary of Transportation in accordance with the Federal Advisory Committee Act to provide information, advice, and recommendations to the Administrator of FRA on matters relating to railroad safety. In 1996, FRA established the RSAC to develop new regulatory standards, through a collaborative process, with all segments of the rail community working together to fashion mutually satisfactory solutions on safety regulatory issues.

On November 5, 2015, the RSAC accepted Task No. 15-04: "Hazardous Materials Issues," which would assign HMIWG to consider several revisions to the HMR to enhance rail safety.[26] Proposed

[26] More information about the RSAC, including meeting minutes and other supporting documents can be found at: https://rsac.fra.dot.gov/.

regulatory changes require consensus approval by the HMIWG. On May 25, 2017, RSAC voted and approved on the proposed regulatory text provided by HMIWG.

The RSAC consensus recommendations propose to make amendments to update, clarify, or remove existing requirements that are outdated or unnecessary. The consensus recommendations proposed the following changes, among others: (1) require tank car facilities to register with PHMSA; (2) update materials incorporated by reference, like the AAR Specifications for Tank Cars; and (3) revise the requirements for OTMAs.

3.3.4. Costs of the Rulemaking

The NPRM proposes several changes to the HMR affecting rail transportation. Two of these changes have costs that would be imposed on tank car facilities and other entities. These costs are detailed below. These same changes would result in some benefits, which are discussed quantitatively and qualitatively later in this analysis.

3.3.4.1. Registration Costs for Tank Car Facilities

In a proposed new subpart J in Part 107, PHMSA and FRA propose to require tank car facilities to be registered with PHMSA. Oversight of the registration program combined with regular compliance audits would maintain an equivalent level of safety to the current requirements, while reducing administrative delays.

This proposed registration requirement would replace the current requirement for approval of tank car facility QAPs through AAR. Requiring each tank car facility to register with PHMSA and certify that that they maintain a QAP that meets the requirements of § 179.7 will give PHMSA and FRA new oversight of tank car facilities, and the ability to suspend or terminate their ability to operate for cause. PHMSA and FRA do not have a current, accurate list of tank car facilities or their activities, making enforcement difficult. This registration program would create an inventory of tank car facilities that qualify tank cars for service.

The proposed registration process would require about two hours per tank car facility to gather information about its employees and business practices. AAR already requires tank car facilities to be registered with them. Therefore, much of the information being requested by PHMSA would already be known by the facility. The two hours would be spent gathering the information and sending an e-mail or letter to PHMSA. This would likely be done by a compliance officer whose average wage rate is $37.01.[27] The burdened wage rate is $64.77.[28]

The estimated number of tank car facilities is 275.[29] Therefore, the total cost in the first year would $35,622.[30] These facilities would be required to renew their registration every six years. The time

[27] See: https://www.bls.gov/news.release/ocwage.t01.htm.
[28] Calculation: $37.01 + (75% * $37.01) = $64.77.
[29] Source: FRA Hazardous Materials Division, July 2023.
[30] Calculation: $64.77 * 2 hours * 275 facilities = $35,622.

spent renewing the registration would require just 30 minutes per facility. Therefore, the renewal cost every six years would be $8,906.[31]

The total cost over the 10-year period is $44,528. The discounted rate is $43,530 (PV, two percent) and $43,080 (PV, three percent).

The benefit to this proposed change is that PHMSA and FRA would have direct oversight of tank car facilities for enforcement. FRA, in consultation with PHMSA, could suspend or terminate registration if it found a facility was not conforming with the regulations and failed to take corrective actions. This proposed change would also give PHMSA and FRA direct access to information about the tank car facilities. Transport Canada already requires this information, so this also harmonizes the U.S. with Canada. FMCSA already requires registration for cargo tank facilities that inspect or repair highway cargo tanks.

3.3.4.2. Registration Costs for Design Certifying Engineers

In a new proposed subpart J in Part 107, PHMSA and FRA propose to require that each person (i.e., each individual, firm, partnership, corporation, company, association, or joint-stock association) who conducts design review of tank cars or service equipment must register with PHMSA. Each individual engineer employed to conduct the design reviews must be named in the registration and will receive a unique, separate identifier associated with the company's tank car DCE registration.

Currently, the HMR delegates sole authority to approve tank car and service equipment designs to AAR. The NPRM proposes to replace AAR's design review and approval with review and approval by a tank car DCE, a process already in use for cargo tank motor vehicles.

This proposal will lower the barrier of entry to tank car design approval by allowing any DCE to review and approve tank car designs, subject to PHMSA registration oversight. By removing the single-source approval requirement, PHMSA and FRA expect that costs for reviewing and approving tank car designs will decrease, while maintaining the current high level of safety. The DCE program may improve approval efficiency for tank car and service equipment designs, including implementation of new technologies. This will increase competition for tank car design services and reduce costs for the regulated community.

PHMSA and FRA expect that the sole delegation of tank car and service equipment design approval authority to AAR is unduly burdensome on the tank car industry. PHMSA and FRA have determined that—based on experience participating in the current AAR TCC process—the process for tank car design approval is conducted in such a way that increases costs and delays to the regulated community, without a commensurate increase in safety that would justify these delays. The HMR requirements have created a single-source, prescriptive system, because only AAR TCC has the authority to approve an application for a tank car design, material of construction, conversion, or alteration under part 179 specifications. The HMR requirements for the review of a tank car design are well understood and include compliance with part 179 and other considerations that a tank car design must take into account (i.e., lading properties, material compatibility,

[31] Calculation: $64.77 * 0.5 hours * 275 facilities = $8,906.

operating temperatures, etc.). There is little doubt that there are many engineers in the United States with tank car structural or mechanical design experience who could review and certify that a tank car's design meets the HMR requirements. Replacing AAR TCC approval with DCE approval as proposed will create a system that increases efficiency in the tank car design approval market by expanding the pool of authorized sources for tank car design approval. The proposed system also includes documentation requirements for DCEs that will facilitate improved government oversight of the design approval process via audits, and allow DCE registrations to be suspended or terminated for cause. PHMSA and FRA expect that a tank car DCE meeting the § 171.8 definition will be able to review the design of a tank car or service equipment and determine whether the design complies with the requirements of Part 179. PHMSA and FRA will oversee DCEs through the proposed registration program.

As proposed, tank car DCEs would now need to be registered with PHMSA. This would require about two hours per person to submit information to PHMSA. The two hours would be spent gathering necessary information and sending an e-mail or letter to PHMSA. This would likely be done by the engineer themselves. The average wage rate for an engineer is $100.00 per hour.[32]

The estimated number of tank car DCEs is 25 across the industry.[33] Therefore, the total cost in the first year would be $5,000.[34] These DCEs would be required to renew their registration every six years. The time spent renewing the registration would require just 30 minutes per DCE. Therefore, the renewal cost every six years would be $1,250.[35]

The total cost over the 10-year period would be $6,250. The discounted cost is $6,110 (PV, two percent) and $6,047 (PV, three percent).

The benefit to this proposed change is that PHMSA and FRA would have a direct line of sight for enforcement of tank car design requirements. PHMSA and FRA could suspend or terminate registration if it found a tank car DCE was not conforming with the regulations. This registration process would streamline PHMSA and FRA tank car design and construction oversight programs.

3.3.4.3. Closure Instructions

The NPRM proposes to require offerors of hazardous materials by rail tank car to have written closure, securement, and examination procedures. There would be a cost associated with this provision. However, there would also be a benefit of fewer non-accident releases (discussed in Section 3.3.6).

Most non-accident releases occur because of improperly secured closures on tank cars. Additionally, the majority of those failures occur at the manway cover due to a failure to secure the manway in accordance with the equipment owner and gasket manufacturer closure instructions, including the bolt securement sequences, tools, and torque specifications. Currently, there is no requirement in the HMR that offerors of tank cars containing hazardous materials develop and

[32] Source: FRA Hazardous Materials Division.
[33] Source: FRA Hazardous Materials Division.
[34] Calculation: $100.00 * 2 hours * 25 DCEs = $5,000.
[35] Calculation: $100.00 * 0.5 hours * 25 DCEs = $1,250.

implement closure procedures that are consistent with the industry standards and original equipment manufacturer (OEM) recommendations.

The proposed changes to § 173.31(d) are designed to close a regulatory gap and ensure that minimum standards for closures on tank cars are equivalent to existing standards for other hazardous materials packages in the HMR. Rail carriers, rail hazmat shippers, and equipment owners and manufacturers all have a vested interest in ensuring tank cars are routinely operated and closed in a reliable and repeatable manner that is consistent with industry standards and OEM recommendations. PHMSA and FRA expect that this proposed regulatory change will result in a net benefit to safety by ensuring proper securement of tank car closures thus reducing the number of overall non-accident hazmat releases by rail.

The NPRM proposes to require the offeror to have and follow a procedure for closing and securing all openings on a tank car prior to shipment. The person responsible for developing or updating the procedure must consider available best practices and guidance from each package and component supplier, such as service equipment manufacturer, gasket manufacturer, tank car owner, or other product-specific closure manufacturer. The procedure must be reviewed and updated to reflect changes or modifications of the equipment design.

Currently, 4,154 offerors are registered with PHMSA to ship hazardous materials by rail. PHMSA and FRA estimate that approximately 95 percent of those offerors already have written instructions that follow best practices from the manufacturer. Those companies would still incur some burden because they may need to combine procedures into one document. For each of those offerors, the burden would be approximately two days by one employee to complete the written procedures. A compliance manager or mid-level manager would complete this task. The average burdened wage rate for that employee is $64.77. The total annual cost for those offerors would be $4,089,472.[36] That burden would be borne across industry over the first year of the analysis.

For the five percent of offerors that lack some written procedures, more time would be required to comply with this proposed regulation. For each of those offerors, the burden would be approximately five days by one employee to complete the written procedures. The same type of employee would complete this task as stated above. The total cost for those offerors would be $538,088.[37] That burden would be borne across industry over the first year of the analysis.

Some offerors belong to organizations like the Chlorine Institute or American Petroleum Institute (API). Those organizations may share information within their membership, which means the estimated burden is higher since it accounts for all offerors preparing the procedures on their own.

PHMSA estimates that new offerors would begin operations at a rate of approximately three percent of the total number of offerors (e.g., approximately 125 new offerors in the second year of the analysis). For those offerors, a compliance manager would need approximately 24 hours to

[36] 4,154 offerors * 95% * $64.77 wage rate * 16 hours = $4,089,472.
[37] 4,154 offerors * 5% * $64.77 wage rate * 40 hours = $538,088.

create the written closure instructions. The total yearly cost for those new facilities would be $193,712.[38] This cost would be incurred in years two through 10.

Some offerors may need to revise their closure instructions periodically. PHMSA estimates that approximately five percent of offerors would revise their plans each year, requiring approximately eight hours from a compliance officer. The annual cost for these revisions would be $107,618.[39] This cost would be incurred in years two through 10.

The total cost of requiring written closure instructions would be approximately $7.3 million over the 10-year analysis. The present value of this would be $7.1 million (two percent) and $7.0 million (three percent).

This proposed change will allow PHMSA and FRA to streamline compliance oversight programs for pre-transportation functions, including appropriate securement of tank cars for transportation. All information about closure and securement instructions would now be in one place, which would lead to more efficient employee training and improved awareness of tank car closure and securement procedures. This section would also result in significant cost savings, which are discussed in section 3.3.5.2.

3.3.4.4. Tank Car Design Approval by Design Certifying Engineer

In the NPRM, PHMSA and FRA propose to remove the requirement that tank car and service equipment designs receive AAR TCC approval. PHMSA and FRA propose to replace AAR TCC design approval with tank car DCE approval.

Federal hazardous material transportation regulations have delegated authority to approve tank car and service equipment designs to AAR, and various predecessor organizations, since at least 1927. PHMSA and FRA expect that this presents an undue burden to the tank car design and manufacturing community. This proposal will lower the barrier of entry to tank car design approval by allowing any tank car DCE to review and approve tank car designs, subject to PHMSA registration oversight.

By removing the single-source approval requirement, PHMSA and FRA expect that costs for reviewing and approving tank car designs will decrease, while maintaining the current high level of safety. The tank car DCE program may improve approval efficiency for tank car and service equipment designs, including implementation of new technologies.

PHMSA estimates that there would be approximately 350 DCE approvals per year. Each DCE approval would require approximately 10 hours by an engineer. The average wage rate for an engineer is approximately $100.00.[40] Therefore, the average annual cost for all DCE approvals would be $350,000.[41]

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[38] 4,154 offerors * 3% * $64.77 wage rate * 24 hours = $193,712.
[39] 4,154 offerors * 5% * $64.77 wage rate * 8 hours = $107,618.
[40] Source: FRA Hazardous Materials Division.
[41] 350 DCE approvals * 10 hours * $100.00 per hour wage rate = $350,000.

The total cost of tank car design approvals would be approximately $3.5 million over the 10-year analysis. The present value of this would be $3.2 million (two percent) and $3.1 million (three percent).

This proposed new provision would result in a cost for industry because of the requirement to have a DCE approve tank car designs. However, this cost would be offset by the cost savings from not having to pay AAR to approve tank car designs. That cost savings is discussed in Section 3.3.5.3 of this PRIA. As PHMSA and FRA would now have direct oversight over tank car designs, safety would not be negatively impacted.

3.3.4.5. Summary of Costs

For the 10-year period of analysis, the estimated total cost of this proposed rule is $10.9 million. Discounted values of the costs are $9.3 million (PV, two percent) and $10.1 million (PV, three percent). Exhibit 8 below summarizes the costs.

Exhibit 8. Total 10-Year Costs - Rail

Category	Undiscounted	PV 2%	PV 3%
Facility Registration	$44,528	43,530	$43,080
DCE Registration	$6,250	6,110	$6,047
Closure and Securement Instructions	$7,339,526	7,087,083	$6,973,744
DCE Approval of Tank Car Design	$3,500,000	3,206,783	$3,075,138
Total	**$10,890,303**	**10,343,506**	**$10,098,010**
Annualized		**1,151,507**	**$678,745**

3.3.5. Cost Savings

The NPRM proposes several changes to the HMR for rail transportation. Some of the proposed changes would result in cost savings for industry and are detailed below.

3.3.5.1. Fewer OTMAs (Not Required Now for Clean Cars)

An OTMA is required to authorize movement for a non-conforming or leaking package, unless it is necessary to reduce or eliminate an immediate safety risk. PHMSA proposes to revise § 174.50 to identify more clearly the applicability of OTMAs, in particular exceptions for circumstances in which OTMAs are not required.

PHMSA proposes to revise § 174.50 to clarify that OTMAs are not required for clean cars. A non-conforming rail car that does not contain any hazardous material may be moved without repair or approval, provided the non-conforming condition does not affect the structural integrity of the railcar. These are typically DOT-111 tank cars that are not carrying hazmat and have been cleaned. Currently, FRA receives approximately 860 OTMAs per year for clean cars.[42]

[42] Source: FRA Hazardous Materials Division.

Each railroad spends approximately 30 minutes preparing each OTMA.[43] Assuming that a compliance manager submits the paperwork required for an OTMA, the total cost savings per OTMA is $32.38.[44] Therefore, the total yearly cost savings is approximately $27,850.[45]

The total cost savings over the 10-year analysis would be $278,500. The present value would be $255,169 (two percent) and $244,693 (three percent).

3.3.5.2. Fewer OTMAs (Closure Instructions)

PHMSA proposes that tank car facilities require written closure instructions for tank cars. This would prevent some OTMAs from being needed. As discussed in section 3.3.6.1, the proposal may prevent up to 15 percent of OTMAs from being needed due to procedures being more clearly documented and implemented.

Between 2018 and 2022, there were an average of 6,123 OTMAs per year.[46] In order to estimate the number of OTMAs that may be eliminated, PHMSA examined a certain type of NAR that would be significantly addressed by this rule change.

Hinged and bolted manway covers accounted for an average of 125 NARs per year from 2017–2021. The total number of all NARs from tank cars was 365. Therefore, hinged and bolted manway covers accounted for approximately 34 percent of all tank car NARs.

PHMSA and FRA estimate that establishing and following written procedures could prevent 50 percent of hinged and bolted manway cover non-accident releases. Therefore, this proposed regulation may prevent 17 percent of all non-accident tank car releases. That benefit is addressed in Section 3.3.6.1.

Applying the same methodology, PHMSA expects this proposed requirement should prevent 17 percent of repairs associated with these OTMAs. Using the average of 6,123 OTMAs per year, this rule may prevent 918 tank car repairs per year.[47]

Some OTMAs (approximately 66 percent) will need repairs that can be completed in the field. Therefore, if 66 percent of the prevented 918 tank car repairs would have required field repair, 606 OTMAs per year that would need repairs in the field could be prevented. A conservative estimate of the average for each repair is approximately $1,000. The total yearly cost savings for field OTMAs would be $606,197 (undiscounted).[48]

The remaining OTMAs (34 percent) require tank cars to be transported to a repair facility. Therefore, 312 OTMAs per year that would need these repairs could be prevented. These repairs are more extensive than field repairs. A conservative average of each shop repair is approximately

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[43] Ibid.
[44] Calculation: $64.77 wage rate * 0.5 hours = $32.38.
[45] 860 clean car OTMAs * $64.77 * 0.5 hours = $27,850.
[46] Source: FRA Hazardous Materials Division.
[47] 6,123 OTMA * 17% = 918 OTMAs.
[48] Calculation: 606 field OTMAs prevented * $1,000 (average cost) = $606,197.

$5,000.[49] The total yearly cost savings for shop OTMAs would be $1,561,416 (undiscounted).[50] PHMSA and FRA request comments from the public regarding the estimates of the repairs.

In addition to the repairs being eliminated for these OTMAs, the reduction in paperwork would also result in a cost savings. As discussed in Section 3.3.5.1, each OTMA requires labor of approximately $32.38. Therefore, the annual cost savings for this would be $21,656.[51]

The total 10-year cost savings of fewer OTMAs due to closure and securement instructions would be $22.0 million. The present value would be $20.1 million (two percent) and $19.3 million (three percent).

3.3.5.3. Tank Car Design Submission to AAR

The NPRM proposes to no longer require tank car and service equipment designs to receive AAR TCC approval. PHMSA and FRA propose to replace AAR TCC design approval with tank car DCE approval.

PHMSA and FRA expect that the current AAR design approval presents an undue burden to the tank car design and manufacturing community. By removing the single-source approval requirement, PHMSA and FRA expect costs for reviewing and approving tank car designs to decrease, while maintaining the current high level of safety. The tank car DCE program may improve approval efficiency for tank car and service equipment designs, including implementing new technologies.

PHMSA estimates that the number of tank car designs submitted to AAR annually is 350. The average cost of each approval is approximately $1,200.[52] Therefore, the average annual cost savings for tank car design approvals would be $420,000.[53]

The 10-year cost savings associated with this would be $4.2 million. The present value would be $3.8 million (two percent) and $3.7 million (three percent).

This proposed change in tank car design approvals would result in a significant cost savings for industry. There would be a minimal cost incurred because of the new DCE requirement (discussed in Section 3.3.4.4 of this analysis), but that cost would be more than offset by the cost savings.

3.3.5.4. Quality Assurance Program/AAR Audit No Longer Required

Currently, all tank car facilities must submit their QAP to AAR for approval, in accordance with § 179.7. PHMSA and FRA propose to remove the requirement for QAPs to be approved by AAR. However, tank car facilities must still develop and maintain QAPs that meet the requirements of § 179.7 as PHMSA proposes to require tank car facilities to be registered with PHMSA. This would provide PHMSA and FRA with the ability to oversee tank car facilities and their

[49] Source: FRA Hazardous Materials Division.
[50] Calculation: 312 shop OTMAs prevented * $5,000 (average cost) = $1,561,416.
[51] Calculation: 918 OTMAs prevented * $32.38 (labor rate per OTMA) = $29,744.
[52] Source: FRA Hazardous Materials Division.
[53] Calculation: 350 approvals * $1,200 (average cost) = $420,000.

compliance programs. The proposed registration will maintain an equivalent level of safety while reducing administrative burden.

The current requirement for AAR to review and approve each tank car facility's QAP creates an undue burden on the facility and can create delays that hinder commerce. Currently, PHMSA estimates the average cost per year for AAR to audit and approve each facility is approximately $16,000. This includes $15,000 for the audit and an additional 16 hours of labor after the audit to clarify or discuss with AAR.[54] Therefore, the annual cost for facility approval for all facilities is $4,409,977.[55] This would no longer be required and results in a cost savings of that amount.

The total cost savings over the 10-year analysis would be $44.1 million. The present value would be $40.4 million (two percent) and $38.7 million (three percent).

Eliminating the requirement for QAP approval by AAR would significantly reduce the burden on industry. Facilities would still be required to maintain a QAP and self-certify that it meets the requirements of § 179.7. The new registration process with PHMSA would ensure that the safety of these facilities is not compromised.

3.3.5.5. Summary of Cost Savings

For the 10-year period of analysis, the estimated total cost savings of this proposed rule would be $70.6 million. Discounted values of the costs are $64.6 million (PV, two percent) and $62.0 million (PV, three percent). Exhibit 9 below summarizes the cost savings.

Exhibit 9. Total 10-year Cost Savings - Rail

Category	Undiscounted	PV 2%	PV 3%
Fewer Cleaned and Empty OTMAs	$278,500	255,169	$244,693
Fewer OTMAs due to Closure Instructions	$21,973,566	20,132,702	$19,306,215
Tank Car Design Savings	$4,200,000	3,848,139	$3,690,166
QAP No AAR Approval Required	$44,099,770	40,405,253	$38,746,538
Total	**$70,551,837**	**64,641,263**	**$61,987,612**
Annualized		**7,196,287**	**$4,166,541**

3.3.6. Benefits

3.3.6.1. Non-Accident Releases

The NPRM proposes to require offerors of hazardous materials by rail to have written closure, securement, and examination procedures. Currently, there is no requirement in the HMR that offerors of tank cars containing hazardous materials develop and implement closure procedures

[54] Source: FRA Hazardous Materials Division.
[55] Calculation: 275 facilities * ($15,000 + ($64.77 wage rate * 16 hours per year)) = $4,409,977.

that are consistent with the industry standards and OEM recommendations. The proposed requirement would reduce the number of non-accident releases.

Most non-accident releases occur because of improperly secured closures on tank cars. Additionally, the majority of those failures occur at the manway cover due to a failure to secure the manway in accordance with the equipment owner and gasket manufacturer closure instructions, including the bolt securement sequences, tools, and torque specifications.

The proposed changes to § 173.31(d) are designed to close a regulatory gap and ensure that minimum standards for closures on tank cars are equivalent to existing standards for other hazardous materials packages in the HMR. Rail carriers, rail hazmat shippers, and equipment owners and manufacturers all have a vested interest in ensuring tank cars are routinely operated and closed in a reliable and repeatable manner that is consistent with industry standards and OEM recommendations. PHMSA and FRA expect that this proposed regulatory change will result in a net benefit to safety by ensuring proper securement of tank car closures thus reducing the number of overall non-accident hazmat releases by rail.

As proposed, the offeror must have and follow a written procedure for closing and securing all openings on a tank car prior to shipment. Furthermore, the person responsible for developing or updating the procedure must consider available best practices and guidance from each package and component supplier, such as the service equipment manufacturer, gasket manufacturer, tank car owner, or other product-specific closure manufacturer. Lastly, the procedure must be reviewed and updated to reflect changes or modifications of the equipment design.

From 2017–2021, hinged and bolted manway covers accounted for an average of 125 NARs per year in the U.S. The average number of all tank car NARs over that time period was 365 per year, meaning hinged and bolted manway covers accounted for approximately 34 percent of all tank car NARs.

PHMSA and FRA estimate that establishing and following written procedures could prevent 50 percent of hinged and bolted manway cover non-accident releases. Therefore, this proposed regulation may prevent 17 percent of all non-accident tank car releases. That would equal approximately 62 NARs per year that could be prevented by the regulation. Each NAR has an approximate cost of $10,000.[56] This includes costs to the shipper, railroad, and any foregone profit.

The total benefit over the 10-year period is approximately $6.2 million. The discounted total is $5.7 million (PV, two percent) and $5.4 million.

3.3.7. Conclusion

Some costs would be incurred by industry to comply with the amendments in the NPRM, if codified in a final rule. This includes costs of requiring tank car repair facilities and DCEs to register with PHMSA. Also, costs will be incurred by requiring offerors to document their closure and securement instructions for tank cars. Finally, costs would be incurred by the requirement to have a tank car DCE certify tank car design. The total costs would be $10.9 million. The

[56] Source: FRA Hazardous Materials Division.

discounted values are $10.3 million (two percent, PV) and $10.1 million (three percent, PV). These costs would be more than offset by the cost savings from this proposed rule.

Exhibit 10. Total 10-year Costs - Rail

Category	Undiscounted	PV 2%	PV 3%
Facility Registration	$44,528	43,530	$43,080
DCE Registration	$6,250	6,110	$6,047
Closure and Securement Instructions	$7,339,526	7,087,083	$6,973,744
DCE Approval of Tank Car Design	$3,500,000	3,206,783	$3,075,138
Total	**$10,890,303**	**10,343,506**	**$10,098,010**
Annualized		**1,151,507**	**$678,745**

As proposed, PHMSA estimates that railroads will realize cost savings due to fewer OTMAs as they would no longer be required for clean cars. Written closure and securement instructions would also reduce the number of OTMAs. Finally, railroads would save money because they would no longer need to have their facilities' quality assurance programs and tank car designs approved by AAR. The total estimated cost savings would be $70.6 million over the 10-year analysis. The discounted values are $64.6 million (two percent, PV) and $62.0 million (three percent, PV).

Exhibit 11. Total 10-year Cost Savings - Rail

Category	Undiscounted	PV 2%	PV 3%
Fewer Cleaned and Empty OTMAs	$278,500	255,169	$244,693
Fewer OTMAs due to Closure Instructions	$21,973,566	20,132,702	$19,306,215
Tank Car Design Savings	$4,200,000	3,848,139	$3,690,166
QAP – No AAR Approval Required	$44,099,770	40,405,253	$38,746,538
Total	**$70,551,837**	**64,641,263**	**$61,987,612**
Annualized		**7,196,287**	**7,266,839**

PHMSA estimates that benefits will accrue due to fewer NARs. The total estimated benefits of this proposed rule over the 10-year analysis would be $6.2 million. The discounted values are $5.7 million (two percent, PV) and $5.4 million (three percent, PV).

Exhibit 12. Total 10-year Benefits - Rail

Category	Undiscounted	PV 2%	PV 3%
NAR	$6,200,000	5,680,587	$5,447,388
Total	**$6,200,000**	**5,680,587**	**$5,447,388**
Annualized		**632,400**	**638,600**

4. Conclusion

In the NPRM, PHMSA—in conjunction with FMCSA, FRA, and USCG—proposes numerous revisions to the HMR related to highway, rail, and vessel transportation of hazardous materials. These proposed revisions are designed to maintain or enhance the safe transportation of hazardous materials while increasing clarity and consistency. In addition, the proposed amendments reflect changing conditions and trends that affect the safe transportation of hazardous materials while still maintaining or enhancing safety.

The proposed revisions would benefit the economy by reducing unnecessary costs and improving safety by reducing the number of hazardous materials release incidents. Entities that transport, inspect, repair, and requalify hazmat packages—including cargo tanks and rail tank cars—would incur some costs related to this proposed rule. However, those costs would be more than offset by the cost savings. This rule would also increase safety by reducing the number of accidental and non-accident releases.

5. Initial Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980, as amended, requires federal agencies promulgating regulations to assess the impacts on small businesses when considering proposed regulations. Such analysis is useful to inform the public about the impacts of a proposed rule and highlight any effects that may disproportionately affect small businesses. At the NPRM stage, agencies are required to conduct an initial regulatory flexibility analysis (IRFA). At the final rule stage, agencies are required to conduct a final regulatory flexibility analysis (FRFA). This section presents the IRFA for the accompanying NPRM. The statute requires that the analysis contain:

1) a description of the reasons why action by the agency is being considered;
2) a succinct statement of the objectives of, and legal basis for, the proposed rule;
3) a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
4) a description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and
5) an identification, to the extent practicable, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule.

Each IRFA shall also contain a description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives such as:

1) Establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
2) Clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;

3) Use of performance rather than design standards; and
4) Exemption from coverage of the rule, or any part thereof, for such small entities.

This analysis addresses each of these elements in succession:

5.1. A description of the reasons why action by the agency is being considered:

As stated in the accompanying NPRM, the intent of this proposed rule is to amend the HMR to adopt a number of actions that will maintain or enhance the safe transportation of hazardous materials while increasing clarity and consistency. In addition, the proposed amendments also reflect changing conditions and trends that affect the safe transportation of hazardous materials while still maintaining or enhancing safety. The proposed amendments affect shipments by three modes of transportation: highway, rail, and vessel. Many of the proposed amendments are editorial in nature and merely clarify existing standards. Others are enabling, in that they enable use of new technology or allow operational flexibility in ways that maintain current safety. Other proposed amendments impose more stringent requirements to enhance safety.

5.2. A succinct statement of the objectives of, and legal basis for, the proposed rule:

In the NPRM, PHMSA proposes to amend the HMR to increase clarity and consistency, increase safety, and update requirements to reflect changing conditions and trends that affect the safe transportation of hazardous materials. The following are some noteworthy proposals set forth in the NPRM:

- Revisions to tank car use requirements based on work conducted by RSAC;
- Revision of tank car and service equipment design approval requirements;
- Revisions to cargo tank specification and requalification requirements; and
- Revision of marking requirements for cargo tanks containing more than one petroleum distillate fuel in different trips during the previous or current business day.

This rulemaking is published under the authority of federal hazardous materials transportation law (Federal hazmat law; 49 U.S.C. 5101 *et seq.*), which authorizes the Secretary of Transportation to "prescribe regulations for the safe transportation, including security, of hazardous materials in intrastate, interstate, and foreign commerce." The Secretary's authority is delegated to the Administrator of PHMSA at 49 CFR 1.97. This rulemaking proposes to amend specific provisions related to the highway, rail, and vessel transportation of hazardous materials.

5.3. A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply:

The proposed amendments affect a large number of entities in many sectors of the economy, but the entities most directly affected are ports, motor carriers, and rail carriers. PHMSA focuses on those provisions that have adverse impacts on small entities because the statutory language establishing the IRFA requirement focuses primarily on changes that may have adverse impacts

on small businesses. The Small Business Administration's (SBA) Office of Advocacy states Congress's Findings and Declaration of Purpose behind the RFA requirement:[57]

(a) The Congress finds and declares that —

1) when adopting regulations to protect the health, safety, and economic welfare of the nation, federal agencies should seek to achieve statutory goals as effectively and efficiently as possible without imposing unnecessary burdens on the public;
2) laws and regulations designed for application to large scale entities have been applied uniformly to small businesses, small organizations, and small governmental jurisdictions even though the problems that gave rise to government action may not have been caused by those smaller entities;
3) uniform federal regulatory and reporting requirements have in numerous instances imposed unnecessary and disproportionately burdensome demands including legal, accounting, and consulting costs upon small businesses, small organizations, and small governmental jurisdictions with limited resources;
4) the failure to recognize differences in the scale and resources of regulated entities has in numerous instances adversely affected competition in the marketplace, discouraged innovation, and restricted improvements in productivity; and
5) unnecessary regulations create entry barriers in many industries and discourage potential entrepreneurs from introducing beneficial products and processes.

These findings and declarations primarily focus on negative or adverse impacts from regulation on businesses, such as "achiev[ing] statutory goals…without imposing unnecessary burdens" and striving to mitigate regulatory and reporting requirements that "impose unnecessary and disproportionately burdensome demands…on small businesses, small organizations, and small governmental jurisdictions with limited resources." PHMSA, therefore, focuses this analysis on those proposed amendments in the accompanying NPRM that have adverse impacts. As noted above, on net, the effects of this rule on businesses, including small entities, is positive—cost savings are greater than costs. Such cost savings would benefit entities small and large. Those few provisions with regulatory impacts generally affect motor carriers, railroads, and U.S. ports, so PHMSA focuses the identification of affected entities on these three entity groups.

PHMSA begins with an identification of the rulemaking provisions that have a regulatory or negative economic impact on small entities. These include:

- For vessel provisions, the proposed amendments include the requirement that entities supply shipping papers in a timelier manner during inspections and the elimination of the use of the "DANGEROUS" placard. PHMSA seeks comment on any other proposed changes for vessel transportation that may have unanticipated impacts on small businesses.
- For the motor carrier provisions, these proposed amendments include the requirement of bonding and grounding cargo tank loads during transfer of combustible liquids to or from the cargo tank; the requirement that remote shutoff systems on cargo tanks not be

[57] https://advocacy.sba.gov/resources/the-regulatory-flexibility-act/

obstructed; the requirement that cargo tanks pressure tested at greater than 50 PSI be only pressure tested hydrostatically; and the requirement for cargo tank facilities to mark their CT number on a cargo tank following inspection. PHMSA seeks comment on whether any other provisions related to motor carrier requirement, either those discussed in the accompanying PRIA or in the NPRM that were deemed to be editorial and not in need of economic assessment, have unanticipated impacts on small businesses.

- For the rail industry, these proposed amendments include the provisions requiring tank car facilities and tank car DCEs to register with PHMSA, and for shippers of hazardous materials in bulk rail tank cars to document closure instructions. The proposed tank car DCE registration requirement is a result of the proposed decision to enable DCEs to approve tank car designs rather than continuing to provide AAR's TCC with the sole authority for such approvals. As a result, the entities that would bear this burden are relieved of the requirement to coordinate approval through the AAR, which PHMSA has estimated would reduce costs to those entities seeking tank car design approval. As a result, on net, these combined proposed amendments are net cost saving. Nevertheless, PHMSA presents the registration costs associated with the proposed registration in the PRIA. The proposed closure documentation requirement is a new regulatory provision and the costs to small entities are also discussed below. PHMSA notes that on balance, the cost savings associated with the proposed rail provisions more than offset the costs imposed. PHMSA and FRA request comment on the accuracy and size of estimated costs and benefits for the provisions affecting the rail industry.

5.4. A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply

The SBA establishes industry thresholds that determine whether a particular entity qualifies as a small business. These thresholds are generally either based on total revenue or on number of employees. In addition, agencies are enabled to develop their own definitions, depending on the nature of the industry they regulate. For the trucking industry, there is a revenue threshold of $27.5 million per year.[58] Firms with revenues that exceed this figure are not considered small businesses. Those with revenues below this figure are considered to be small businesses. For port and harbor operations, the revenue threshold is $38.5 million. FRA has developed a rail-specific small business definition based on railroad "class;" Class I railroads are not considered to be small entities, whereas Class II and III railroads are considered to be small entities.

5.4.1. USCG Provision Small Entities

The vessel-related proposed provisions that impose increased regulation are the requirement to provide shipping papers for containers readily and the elimination of the "DANGEROUS" placard. The second of these proposed provisions—elimination of the "DANGEROUS" placard—is most likely to affect trucking firms, as will be described below. The other provision affects port facilities that handle containers which contain hazardous materials.

[58] https://www.sba.gov/sites/default/files/2018-07/NAICS%202017%20Table%20of%20Size%20Standards.pdf

5.4.2. Motor Carrier Small Entities

The motor carrier industry is characterized by a high proportion of small entities. At least 99 percent of firms in the industry qualify as small businesses because they have revenues of less than $27.5 million per year. Looking specifically at hazardous materials carriers, FMCSA queried their motor carrier registration database and identified 115,925 hazardous materials carriers. These carriers operate a total of 387,421 cargo tanks for an average of 3.34 tanks per carrier. Assuming 99 percent of these carriers qualify as small entities, 114,766 of the firms in this subsector of the motor carrier industry would be small businesses.

In addition to motor carriers, the facilities that requalify cargo tanks would also be affected by the proposed regulations. In some cases, the proposed regulations apply directly to the cargo tank facility. In others, the main impact may fall on the motor carrier. According to motor carrier data, there are approximately 6,015 cargo tank facilities that either repair or inspect cargo tanks. There is little direct information on revenue generated on a per-firm basis, so it is impossible to determine precisely how many of these entities are small businesses. However, looking at U.S. Census Bureau data for the NAICS code in question for firms that inspect and repair cargo tanks—811310 – Commercial and Industrial Machinery Repair and Maintenance—the SBA's small business threshold for firms in this NAICS is $7.5 million in annual revenue. U.S. Census Bureau data on firm size for this NAICS breaks down as follows[59]:

Firm Size Category	Number of Firms	Number of Establishments	Estimated Receipts (thousands)	Revenue per establishment
05: <20	18,293	18,347	$12,705,261	$694,542
06: 20-99	1,200	1,456	$7,655,209	$6,379,341
07: 100-499	254	654	$4,047,059	$15,933,303
09: 500+	239	1,357	$15,290,068	$63,975,180

As can be seen above, firms that have less than 20 employees, and those with between 20 and 99 employees, are likely to fall below the per firm revenue threshold of $7.5 million in revenue or less. Those with more than 100 employees are likely to have revenue above this threshold. Based on this breakdown, approximately 9.2 percent of firms are larger than the revenue threshold and would not qualify as small businesses (2,011 large establishments/21,814 total establishments = 0.09219). This leaves 90.8 percent of firms that qualify as small businesses. Applying this percentage to the number of cargo tank facilities registered with FMCSA (6,015) yields an estimated 5,462 small entities. This may be an overestimate as some of the "larger" small firms (i.e., those with between 20 and 99 employees) may have revenues greater than $7.5 million. Another area of uncertainty is whether firms in the cargo tank inspection and repair industry are roughly equivalent in size relative to the other firms in the NAICS category.

5.4.3. Railroad Small Entities

FRA defines small entity railroads as Class II and III railroads. There are seven Class I railroads in operation, and an estimated 11 Class II and 736 Class III railroads in operation, for a total of

[59] The Census Bureau has preliminary data out for 2017 on firm size at the six digit NAICS level at https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html.

747 small entities in the industry.[60] In addition to railroads, the accompanying regulatory proposals affect tank car manufacturers and tank car inspection and repair facilities. These facilities would employ tank car DCEs and hence bear the cost of the registration requirements for DCEs and tank car facilities. In addition, offerors are the main regulated entity for the closure instructions documentation requirements. Offerors are the shippers that offer hazardous materials for transportation—these would generally be oil and gas companies and chemical manufacturing companies.

FRA obtains tank car facility information from the industry. FRA's most recent data indicates that there are 13 tank car manufacturing facilities and 280 tank car facilities in the U.S. Non-manufacturing tank car facilities are facilities that inspect, maintain, and repair tank cars. Employment information is not directly available for these facilities from FRA, but the U.S. Census Bureau has firm size information for NAICS 336510 – Railroad Rolling Stock Manufacturing. The SBA defines any firm with fewer than 1,500 employees as a small business in this industry. The table below presents the average number of employees per firm for various size categories in the railroad rolling stock sector:

Firm Size Category	Number of Firms	Number of Entities	Number of Employees	Employees per Firm
05: <20	60	60	453	8
06: 20-99	48	53	2072	43
07: 100-499	22	32	3904	177
09: 500+	23	84	23103	1,004

Although a precise identification is not possible, it appears that virtually every entity in this industry qualifies as a small business. Even the largest of firms—those employing 500 or more employees—average well below 1,500 employees. PHMSA and FRA expect the tank car inspection and repair facilities would also be predominantly small entities. Tank car DCEs are likely to work for tank car manufacturing facilities, as these facilities would be the ones seeking approval to build new tank car designs. Additional tank car DCEs may be employed by the AAR TCC if this entity chooses to participate in the tank car DCE program. PHMSA and FRA estimate that roughly 25 tank car DCEs would register with PHMSA if the proposed revisions are adopted.

In addition, shippers that offer products in rail tank cars would be required to document closure instructions. These firms exist in different segments of the petroleum refining and chemical manufacturing sectors. To simplify the assessment of the small entities affected in these industries, PHMSA uses two broad sectors: NAICS 32411 – Petroleum Refineries, and NAICS 325 – Chemical Manufacturing. Petroleum refineries manufacture a variety of petrochemicals including gas, diesel fuel, and other fuels used for liquid fuel, motorized propulsion. The chemical manufacturing sector makes a variety of products including paints and other coatings for wood, metal, and other surfaces; agricultural fertilizers, pesticides, and herbicides; water purification; household cleaning; and industrial gases, amongst a host of other products. A large portion of these

[60] FRA's classification criteria vary from the AAR's, in which railroads are categorized as Class I, Regional, and Local. Refer to AAR's Railroad Facts – 2019 Edition (Class I: 7, Regional: 22, and Local 584, for a total of 613). FRA's total is larger than the AAR's due to additional FRA criteria, including accident reporting requirements.

products qualify as hazardous materials or use hazardous materials during the manufacturing process. The size threshold for small businesses in these two sectors are employment based, with the petroleum refinery sector threshold at fewer than 1,500 employees, and the chemical manufacturing sector at anywhere between 500 and 1,500 employees, depending on the sub-sector. The two tables below present the size breakdown for both industries.

NAICS	Sector	Category	Firms	Establishments	Employment	Employees Per Firm
32411	Petroleum Refineries	05: <20	11	11	67	6
32411	Petroleum Refineries	06: 20-99	5	5	167	33
32411	Petroleum Refineries	07: 100-499	15	18	2,273	152
32411	Petroleum Refineries	09: 500+	39	121	61,087	1,566

NAICS	Sector	Category	Firms	Establishments	Employment	Employees Per Firm
325	Chemical Manufacturing	05: <20	6,025	6,048	34,076	6
325	Chemical Manufacturing	06: 20-99	2,123	2,315	87,156	41
325	Chemical Manufacturing	07: 100-499	939	1,613	138,084	147
325	Chemical Manufacturing	09: 500+	634	3,450	525,409	829

For the petroleum refining industry, the average in the largest firm size category—those with more than 500 employees—is roughly 1,500 employees. It seems reasonable to assume that half the firms in this size category are above the 1,500-employee threshold, and the rest are below it, which means roughly 19 of the 39 firms qualify as small businesses. The firms in the smaller size categories would all qualify as small businesses, which when combined with 19 firms in the largest category leads to an estimate of 50 firms.

For chemical manufacturing, the size threshold varies by sub-sector. For example, the printing ink manufacturing industry has a size threshold of 500 employees. The threshold for phosphate fertilizer manufacturing is 750; for nitrogen fertilizer manufacturing is 1,000; and for pharmaceutical preparation manufacturing is 1,250. The maximum size threshold for all but one sub-sector of chemical manufacturing is 1,250; that exception is the photographic film manufacturing sub-sector, which has a threshold of 1,500. More sub-sectors have a small business size threshold of 1,000 or above than below this level. All have a threshold of 500 at the low end. Thus, it is clear that the only size category in the table above that might contain firms that are not small businesses is the 500+ category. Even these firms have, on average, fewer than 1,000 employees. It seems reasonable, given the distribution of size thresholds, to assume that roughly 60 percent of firms in this largest firm size category qualify as small businesses. This leaves about

254 firms that do not qualify as small businesses, leaving 9,467 firms that do qualify as small businesses, or about 97.4 percent of total entities.

However, not all these firms ship hazardous materials by rail. PHMSA and FRA identified 4,618 offerors of hazardous materials by rail. If 97.4 percent of these firms are small businesses, that implies roughly 4,499 small entities that would be required to comply with the closure documentation requirements. For most of these firms the burden is estimated to be fairly minimal but for a small subset—five percent, which equates to roughly 225 entities—the burden is heavier.

5.5. A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record:

As noted above, PHMSA focuses this discussion on the regulatory proposals in the accompanying NPRM. PHMSA notes that, on net, affected entities gain more in reduced compliance costs and other beneficial effects of regulatory modernization than they will bear in increased costs due to the imposition of new regulations in the rule. That is, on net, compliance and other costs are reduced by the accompanying rule. Small entities benefit from this reduction in regulatory burdens and should, on net, benefit from the changes proposed in the NPRM.

That said, PHMSA considers the impact of the regulatory provisions in the NPRM on small entities and whether those provisions place an undue burden on these entities because they require specialized reporting or recordkeeping or other requirements that small businesses in these industries may not have the skill, experience, or ability to carry out. PHMSA begins with the vessel provisions, then discusses the motor carrier provisions, and ends with the railroad provisions.

5.5.1. Vessel Provisions

There are two proposed provisions in the accompanying NPRM that would have a regulatory impact. The first is the proposed requirement to provide shipping papers for containers transporting hazardous materials in a timelier manner. Note that the expected impact is primarily on ports, but the proposed regulation applies to all modes of transportation. However, PHMSA and its modal partners expect that rail, truck, and air modes of transportation would have no difficulty complying with this requirement. Generally, shipping papers travel along with the shipment when containers are shipped via these modes, and producing shipping papers in a timelier manner is complied with by default. The primary issue, therefore, is ports, where shipping papers in some cases are produced up to 24 hours after the request by USCG inspection personnel.

Under current regulations, a port is required to "maintain a copy of the shipping paper or an electronic image thereof that is accessible at or through its principal place of business." PHMSA proposes to create a clear and enforceable timeframe standard of "readily accessible for inspection." While there is no new documentation requirement associated with this proposed change—ports are in fact currently required to produce hazardous material shipping papers—the new requirement may necessitate changes in operations at certain ports to meet the revised standard. These proposed changes to provide shipping papers more quickly than current practice

would likely have costs associated with them. Unfortunately, neither PHMSA nor USCG has enough information on the details of port operations to estimate the costs of any changes necessitated by this proposed requirement. PHMSA seeks comment from ports on the likely impact and whether that impact would fall disproportionately on ports that fall under the $38.5 million revenue threshold that defines small businesses in this entity class. In addition, PHMSA seeks comment on ways to mitigate these impacts while still enabling the production of shipping papers in a timelier manner during container inspections.

The second proposed provision is the elimination of the "DANGEROUS" placard used for mixed hazardous materials shipments under certain circumstances. The IMDG Code and other international hazardous materials shipping codes do not allow for use of the "DANGEROUS" placard when shipping hazardous materials internationally by vessel. Thus, this placard is rarely, if ever, seen aboard international marine vessels. Restricting the use of this placard would therefore not be an issue for most marine shipments.

According to USCG staff, the most common exception to this rule might be a shipment by truck that boards a ferry to transit a waterway. In this case, the truck may be using a "DANGEROUS" placard rather than placarding for each hazardous materials class present on the truck. Since such movements would likely be domestic or between the U.S. and Canada (Canada also recognizes the "DANGEROUS" placard), compliance with the IMDG Code placarding requirements may not necessarily be considered by the shipper or carrier.

This proposed regulatory change, therefore, would primarily affect motor carriers or shippers who ship via motor carrier that use ferry services either between the U.S. and Canada or within the U.S. These entities would be most likely to use the "DANGEROUS" placard when making a short ferry trip. Unfortunately, neither PHMSA, FMCSA, nor FRA has any information on the number of shipments that might be affected by the proposed change in regulation. Motor carriers could respond by placarding trucks with all hazardous materials present. This may entail purchase of additional placards. Truck placards can be purchased for a range of prices, generally from $11 to $50.[61] Without more information on the number of shipments that would be affected or the number of placards needed—which is determined by the mix of hazardous materials classes in the mixed freight shipments eligible for the "DANGEROUS" placard—total cost estimates cannot be developed. Most hazardous materials motor carriers are familiar with placarding requirements, so neither PHMSA nor its modal partners expect proper placarding to pose difficulty for carriers from a specialized knowledge standpoint.

5.5.2. Motor Carrier Provisions

As noted in the PRIA, the proposed motor carrier provisions that expand regulatory requirements include requiring hydrostatic testing to pressure test CTMVs that are tested at 50 PSI or more; requiring cargo tank facilities to mark inspected cargo tanks with their CT number; requiring bonding and grounding during transfer of product when loading or unloading cargo tanks with combustible liquids or flammable liquids reclassified as combustible liquids; and ensuring that

[61] For example, see https://www.labelmaster.com/shop/placards/hazard-class-2-placards/flammable-gas-worded-placards/. This information is provided strictly for education purposes and is not an endorsement of this product.

cargo tank remote shutoff controls are not obstructed by appurtenances added to the cargo tank motor vehicle.

Given that the motor carrier industry, and the hazmat carrier segment in particular, is dominated by small firms, changes in regulations that affect most firms would in turn affect a "substantial number" of small businesses. This same general rule may apply to the facilities that inspect, repair, and requalify cargo tanks. The costs associated with these provisions, as documented in the accompanying PRIA, are generally modest and would not rise to the level of significant impacts. Below, PHMSA describes the impacts for the proposed provisions that were deemed to be regulatory in nature.

Firstly, the costs associated with the proposal to ensure that remote shutoff devices are not obstructed by appurtenances would fall on motor carriers that have this particular issue. It is important to note that this issue is not present on all, or even a majority, of cargo tanks. As a result, this provision may not affect a substantial number of motor carriers, but the issue does pose an obvious safety hazard. The purpose of remote shutoff systems is to be able to close a valve from which a hazardous material is spilling from a safe distance, rather than at the valve itself, which would expose the person attempting to close the valve to direct contact with the hazardous material spilling from the valve. Ensuring that remote shutoff devices are easily accessible and able to be activated protects the health and safety of the cargo tank operator and mitigates uncontrolled release of hazardous materials into the environment.

PHMSA cannot estimate the cost per cargo tank for making these modifications, and hence cannot say for certain whether that cost would rise to the level of a "significant impact." However, it is likely that cargo tank owners have the ability themselves, or have access to a repair facility with the ability, to remove or move any aftermarket appurtenances that obstruct the shutoff valve. It is likely that these same motor carriers should have the expertise and ability to make, or find a shop qualified to make, such changes to the configuration of appurtenances or shutoff devices to comply with this requirement. Neither PHMSA nor FMCSA have sufficient information to estimate the cost of this modification nor information on how many cargo tanks would need to be modified. There are no recordkeeping requirements associated with ensuring that the remote shutoff device is not obstructed. In addition, motor carriers are given until the date of their next cargo tank qualification inspection to make the necessary modifications, so the required modifications could be done when most convenient, rather than immediately.

Secondly, the accompanying NPRM also proposes requiring bonding and grounding of CTMVs hauling combustible liquids or flammable liquids reclassified as combustible liquids when transferring product to or from another tank. Bonding and grounding is a simple process of hooking a conductive metal cable from the CTMV to the tank to or from which the combustible liquid is being transferred. The connection prevents the buildup of static electricity that can cause a fire or explosion during transfer of material. Bonding and grounding during transfer of flammable liquids is already required by the HMR and most motor carriers that haul hazardous materials should be familiar with this relatively simple and straightforward process. The necessary equipment can be as simple as a metal cable with jumper cable-type alligator clips that is long enough to run between the two tanks. In the PRIA, PHMSA assumes each affected cargo tank would be equipped with a rota-reel, retractable steel cable; the per-cargo tank cost is estimated at $336. This requirement does not establish a new recordkeeping requirement or require any

specialized knowledge that may not be accessible to small businesses or put them at a disadvantage. PHMSA seeks comment on whether this proposed requirement produces such an undue burden on small entities; however, PHMSA does not expect a one-time $336 cost qualifies as a significant economic impact. PHMSA is also unaware of any other modification or other intervention that would prevent the buildup of static electricity during transfer of material. As described in the accompanying PRIA, although rare, the incidents that result from static electricity buildup can cause fairly serious outcomes, including fires and explosions.

Thirdly, the proposed requirement to only use hydrostatic pressure testing on cargo tanks that must be pressure tested essentially eliminates the use of pneumatic testing. Neither PHMSA nor FMCSA expects that pneumatic testing is commonly used when pressure testing cargo tanks due to the risk it poses when a cargo tank fails during testing. However, to the extent that pneumatic testing is used, any cost differential between pneumatic and hydrostatic testing would be borne by motor carriers or cargo tank facilities that use pneumatic testing. Neither PHMSA nor FMCSA has specific information on whether there is in fact a cost differential between pneumatic or hydrostatic testing, and if so, how large it is. Without such information, estimating costs for this proposed provision is not possible. Cargo tank facilities that conduct pressure testing should have the expertise, knowledge, and equipment to test cargo tanks hydrostatically. PHMSA does not expect that this requirement places any undue burden on small entities relative to large entities, nor does PHMSA expect that this proposed change would impose a significant impact on small businesses. PHMSA seeks comment on these points.

Finally, the accompanying NPRM proposes to require cargo tank facilities to mark the cargo tanks they inspect with their CT number. The CT number uniquely identifies the facility that last inspected the cargo tank. This information can be useful in case of failure or damage to the tank. Cargo tank facilities are already required to apply markings to cargo tanks, so they have the expertise and equipment to mark the CT number on cargo tanks. These markings are often applied using decals, but other types of marking, such as a spray paint template or plate, can be used as well. The cost associated with this proposed requirement depends on the type of marking that is applied, but PHMSA does not expect that this cost would rise to the level of a significant impact.

5.5.3. Rail Requirements

The rail industry amendments proposed in the accompanying NPRM that establish new or expand existing regulations include requiring tank car facilities to register with PHMSA; requiring tank car DCEs to register with PHMSA; requiring offerors to document closure instructions; and obtaining tank car design approval from a tank car DCE.

The registration requirements are not onerous and PHMSA does not expect they would result in a significant impact on the entities involved. The same entities would no longer have to go to AAR TCC for design approval and therefore are the same entities that benefit from the regulatory relief offered in the accompanying NPRM. These cost savings are expected to outweigh new registration costs. PHMSA seeks comment on whether this interpretation of the proposed changes is correct.

The proposal to document closure instructions affects shippers of bulk tank car shipments of hazardous materials, which would primarily be chemical manufacturers and petroleum refiners. As noted above, a substantial portion of firms in each of these industries qualify as small businesses. It

is important to note that the proposed closure documentation requirements were a unanimous recommendation of the RSAC HMIWG, which consists of representation, not just of railroads, but also chemical manufacturing and petrochemical production firms, in addition to labor representatives and public safety and environmental advocacy representation. In order to be approved, the RSAC provisions had to receive unanimous support from every entity represented in RSAC. Thus, the affected entities—shippers of hazardous materials—could have objected to this proposed provision if it posed an undue burden. It would have been removed from the recommendations and not proposed in this rulemaking. PHMSA expects this is evidence that the requirement does not pose a significant economic burden.

As noted in the PRIA, PHMSA and FRA expect that most shippers already have documented closure instructions or could compile those instructions fairly quickly and easily. PHMSA and FRA estimate that roughly five percent of shippers may not have documented closure instructions and may have to expend more resources to document the proper closure of valves and fittings for tank cars. Under the current regulations, it is the duty of the shipper to properly prepare shipments for transportation. This preparation includes, among other things, properly closing and securing valves and fittings to prevent release of material during the normal course of transportation. Documentation of closure instructions ensures that employees preparing tank cars for shipment have ready access to instructions that provide them with the information necessary to properly close valves, manway covers, and other valves and fittings. Such instructions ensure that tank car fittings, valves, and manway covers are secured properly, and reduce the incidence of non-accidental release of material during transportation.

As described in the PRIA, the 95 percent of shippers largely in compliance may have to dedicate roughly two days of one employee's time to compile the various written closure instructions into one document. PHMSA's assessment of the number of small businesses in the economic sectors that offer hazardous materials for transport indicates roughly, based on the assessment of the U.S. Census Bureau firm size data (presented above), that approximately 97 percent of firms are below the SBA small entity threshold and can be defined as small businesses. PHMSA and FRA do not view this as a significant economic burden but seek comment on this perspective from industry. This leaves five percent of firms that would be more significantly affected. For these firms, one employee would spend a full, five-day work week documenting closure instructions. This is a small minority of firms that would bear this more onerous burden. Again, PHMSA seeks comment on the assumptions used to estimate costs and whether they constitute a significant economic impact on a substantial number of small entities.

The proposed requirement to document closure instructions involves some specialized knowledge. Proper closure of tank car manways, valves, and other fittings is an activity that requires expertise. However, PHMSA and FRA expect that firms shipping hazardous materials in rail tank cars, even those that fall below the small business threshold, would have the specialized knowledge to document fully the proper closure instructions needed to prepare and close tank cars carrying shipments of hazardous material. PHMSA and FRA do not expect that any outside expertise would be necessary for firms that transport hazardous materials by rail to comply with this requirement, but seek comment on this assumption.

5.6. <u>An identification, to the extent practicable, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule:</u>

PHMSA is not aware of any rules that duplicate, overlap, or conflict with any of the proposed changes in the accompanying NPRM. The NPRM proposes numerous changes that affect multiple modes of transportation and multiple package types designed to contain a wide range hazardous materials. Given this complexity and the wide range of proposed amendments, PHMSA seeks comment from affected industries on provisions that may overlap, duplicate, or conflict with existing parts of the HMR.

5.7. A description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and minimize any significant impacts of the proposed rule on small entities:

PHMSA has not been able to identify alternatives that would accomplish the stated objectives of the proposed rule. In many cases, this is because the issue being addressed does not offer alternate means to accomplish the stated objective. For example, shipping papers are necessary for USCG personnel to complete container inspections. The proposed revision to create a more enforceable, shipping paper accessibility standard enables more rapid completion of inspections and improves the efficient use of federal inspection resources. PHMSA and USCG see no means of accomplishing the stated objective (i.e., timelier provision of shipping papers to inspection personnel) other than creating a more enforceable standard for the supply of these documents.

Another example is the proposal to require bonding and grounding of combustible liquids during the transfer to or from a cargo tank; neither PHMSA nor FMCSA are aware of any other means or technological fix that would prevent buildup of static electricity during the transfer of material, and thus prevent the fires and explosions that might result from said buildup. Another example is the proposal to remove or move appurtenances that obstruct or interfere with cargo tank remote shutoff systems. PHMSA and FMCSA see no alternative that would enable ready access to, and activation of, remote shutoff systems other than removing or moving appurtenances to locations where they no longer obstruct the remote shutoff controls. The purpose of the proposal to restrict the use of pneumatic pressure testing to certain cargo tanks is to prevent catastrophic, violent failure of cargo tanks being pressure tested at higher pressures. Using this method poses a threat to the health and safety of the workers who conduct these tests. Neither PHMSA nor FMCSA are aware of an alternative safe way to pneumatically test cargo tanks without the risk of violent rupture. Hence, PHMSA did not consider an alternative. The same issue exists with the proposal to require marking cargo tanks with the CT number of the facility that conducted the requalification inspection or repair. PHMSA and FMCSA see no alternative to this marking that would enable identification of the cargo tank facility that last inspected the tank.

For the rail provisions, the NPRM proposes to require tank car facilities and tank car DCEs to register with PHMSA but enables a tank car DCE to certify tank car designs. Although the proposed registration is a new regulation, it enables regulatory relief in the form of removing the AAR TCC's sole authority to approve tank car designs. PHMSA and FRA expect this change would facilitate more efficient approvals of tank car designs, but for PHMSA and FRA to have oversight of this activity, registration is necessary. On net, the entities bearing the registration costs are also those that benefit from relief, and PHMSA and FRA expect that those entities benefit from reduced costs (*see* the PRIA for a full explanation of this issue).

For the written closure instructions proposed amendment, PHMSA does not see an alternative that would have lower costs and ensure that offerors of hazardous materials for rail transportation have properly documented closure instructions. Proper closure of valves, fittings, manway covers, and other tank car components is necessary to minimize the possible release of hazardous materials during transportation. Providing the employees that engage in this activity with proper procedures is an important safety precaution. PHMSA and FRA seek comment on any alternatives that might reduce the impacts on small entities while still accomplishing the stated goals of the amendments proposed in the NPRM.