■ 3. In § 180.930, add alphabetically the inert ingredients to the table to read as follows:

§ 180.930 Inert ingredients applied to animals; exemptions from the requirement of a tolerance.

* * * * *

Inert ingredients	Limits	Uses
* * * * * * *		
n-Butyl-3-hydroxybutyrate (CAS Reg. No. 53605–94–0)		Solvent.
* * * * * * *		
Isopropyl-3-hydroxybutyrate (CAS Reg. No. 54074–94–1)		Solvent.
* * * * * * *		

■ 4. In § 180.940(a), add alphabetically the inert ingredients to the table in paragraph (a) to read as follows:

§ 180.940 Tolerance exemptions for active and inert ingredients for use in antimicrobial formulations (Food-contact surface sanitizing solutions).

(a) * * *

* * * * *

Pesticide chemical	CAS Reg. No.	Limits
* * * * * * *		
n-Butyl-3-hydroxybutyrate	53605–94–0	Solvent.
* * * * * * *		
Isopropyl-3-hydroxybutyrate	54074–94–1	Solvent.
* * * * * * *		

* * * * *

[FR Doc. 2016–19115 Filed 8–12–16; 8:45 am]

BILLING CODE 6560–50–P

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

49 CFR Parts 173 and 179

[Docket No. PHMSA–2016–0011 (HM–251C)]

RIN 2137–AF17

Hazardous Materials: FAST Act Requirements for Flammable Liquids and Rail Tank Cars

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Final rule.

SUMMARY: The Pipeline and Hazardous Materials Safety Administration is issuing this final rule to codify in the Hazardous Materials Regulations certain mandates and minimum requirements of the FAST Act. Specifically, the FAST Act mandates a revised phase-out schedule for all DOT Specification 111 tank cars used to transport unrefined petroleum products (*e.g.,* petroleum crude oil), ethanol, and other Class 3 flammable liquids. The FAST Act also requires that each tank car built to meet the DOT Specification 117 and each non-jacketed tank car retrofitted to meet the DOT Specification 117R be equipped with a thermal protection blanket that is at least ½-inch thick and meets existing thermal protection standards. Further, the FAST Act mandates minimum top fittings protection requirements for tank cars retrofitted to meet the DOT Specification 117R.

DATES: *Effective:* August 15, 2016.

ADDRESSES: *Docket:* You may view the public docket online at *http://www.regulations.gov* or in person at Dockets Operations, M–30, Ground Floor, Room W12–140, 1200 New Jersey Avenue SE., Washington, DC 20590–0001 between 9 a.m. and 5 p.m. Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Michael Ciccarone, (202) 366–8553, Standards and Rulemaking Division, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue SE., Washington, DC 20590–0001.

SUPPLEMENTARY INFORMATION: The FAST Act instructs the Secretary of Transportation to issue conforming regulatory amendments immediately or soon after the FAST Act's date of enactment (December 4, 2015). Because the actions taken in this final rule simply codify these non-discretionary statutory mandates, PHMSA finds that timely execution of agency functions would be impeded by the procedures of public notice that are normally required by the Administrative Procedure Act. Further, PHMSA sees no reason to delay regulatory action, as we are simply implementing the non-discretionary provisions contained in Sections 7304, 7305, and 7306 of the FAST Act. PHMSA finds that public notice is impracticable and is implementing these changes under the ''good cause'' exemption of the Administrative Procedure Act, 5 U.S.C. 553(b)(3)(B), thus amending the regulations without advance notice and opportunity for public comment.

Abbreviations and Terms

AAR Association of American Railroads
APA Administrative Procedure Act
CFR Code of Federal Regulations
CPC Casualty Prevention Circular
DOT Department of Transportation
EA Environmental Assessment
FAST Act Fixing America's Surface Transportation Act of 2015
FR Federal Register
FRA Federal Railroad Administration
HHFT High-Hazard Flammable Train
HMR Hazardous Materials Regulations
HMT Hazardous Materials Table

NEPA National Environmental Policy Act
NPRM Notice of Proposed Rulemaking
NPV Net Present Value
NTSB National Transportation Safety Board
OMB Office of Management and Budget
PG Packing Group
PHMSA Pipeline and Hazardous Materials Safety Administration
RFA Regulatory Flexibility Act
RIA Regulatory Impact Analysis
RIN Regulation Identifier Number
RSI Railway Supply Institute
TDG Transportation of Dangerous Goods
U.S.C. United States Code

Table of Contents

I. Background

On May 8, 2015, PHMSA (also ''we'' or ''us''), in consultation with the Federal Railroad Administration (FRA), published the final rule ''Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains'' (hereafter ''HM–251 final rule''). The HM–251 final rule was an integral part of the Department's comprehensive approach to ensure the safe transportation of energy products. Specifically, the HM–251 final rule amended the Hazardous Materials Regulations (HMR; 49 CFR parts 171–180) by defining certain trains transporting large volumes of Class 3 flammable liquids as ''high-hazard flammable trains'' (HHFT) and imposing certain operational restrictions, such as speed restrictions, braking systems, and routing.[1] The HM–251 final rule also adopted requirements into the HMR for sampling and testing programs to ensure the proper classification of unrefined petroleum-based products transported under the HMR. Furthermore, the rule codified new tank car design standards—namely the DOT Specification 117 (DOT–117), DOT Specification 117P (DOT–117P), and DOT Specification 117R (DOT–117R)—and established a phase-out schedule for existing DOT Specification 111 (DOT–111) tank cars by requiring use of either a DOT–117, DOT–117P, or DOT–117R tank car by certain dates for the transport of Class 3 flammable liquids in an HHFT.[2] For more information on the HM–251 final rule, please refer to its publication in the **Federal Register** [80 FR 26643; May 8, 2015], as well as the information under Docket No. PHMSA–2012–0082 at the Federal eRulemaking Portal, *www.regulations.gov.*

On December 4, 2015, President Barack Obama signed legislation entitled ''Fixing America's Surface Transportation Act of 2015,'' or the ''FAST Act.'' *See* Public Law 114–94. The FAST Act includes the ''Hazardous Materials Transportation Safety Improvement Act of 2015'' (*see* Sections 7001 through 7311) and instructs the Secretary of Transportation (hereafter ''Secretary'') to make specific regulatory amendments to the tank car design standards and phase-out schedule codified in the HM–251 final rule.

A. Retrofit Schedule (FAST Act Section 7304)

Section 7304 of the FAST Act mandates a commodity-specific phase-out of all DOT–111 tank cars used to transport Class 3 flammable liquids. Specifically, paragraph (a) mandates the phase-out regardless of train composition and requires that, by the dates specified in paragraph (b), all tank cars used to transport Class 3 flammable liquids meet the DOT–117, DOT–117P, or DOT–117R requirements. Paragraph (b) of Section 7304 mandates a commodity-specific phase-out schedule for DOT–111 tank cars used to transport unrefined petroleum products and ethanol—irrespective of the Packing Group (PG)[3] assigned—as well as other Class 3 flammable liquids based on their PGs.

The phase-out schedule mandated in paragraph (b) outlines various compliance end-dates, on or after which the DOT–111 tank car (including DOT–111 tank cars built to the Association of American Railroads' (AAR) Casualty Prevention Circular 1232 standard (CPC–1232)) is no longer authorized to transport Class 3 flammable liquids. Please refer to Section III, ''Section-by-Section Review,'' in this rule for more information on the applicable end-dates of the new phase-out schedule. See Table 1 below for a comparison of the retrofit schedule of the HM–251 final rule with the schedule imposed by the FAST Act:

TABLE 1—COMPARISON OF HM–251 TANK CAR PHASE-OUT SCHEDULE VS. FAST ACT PHASE-OUT SCHEDULE

[Tank cars in Class 3 flammable liquid service]

Tank car type/service	HM–251 phase-out deadline[4]	FAST Act phase-out deadline[5]
Non-jacketed DOT–111s	PG I—January 1, 2018[6]	Crude[7]—January 1, 2018
	PG II—May 1, 2023	Ethanol—May 1, 2023
	PG III—May 1, 2025	Flammable PG I—May 1, 2025**
		Flammable PG II/III—May 1, 2029*
Jacketed DOT–111s	PG I—March 1, 2018	Crude—March 1, 2018
	PG II—May 1, 2023	Ethanol—May 1, 2023
	PG III—May 1, 2025	Flammable PG I—May 1, 2025**
		Flammable PG II/III—May 1, 2029*
Non-jacketed CPC–1232s	PG I—April 1, 2020	Crude—April 1, 2020

[1] The HM–251 final rule defined an HHFT as a train comprised of 20 or more loaded tank cars of a Class 3 flammable liquid in a continuous block or 35 or more loaded tank cars of a Class 3 flammable liquid across the entire train.

[2] ''DOT–117P'' tank cars are newly manufactured tank cars or tank cars retrofitted to meet the performance criteria in § 179.202–12. ''DOT–117R'' tank cars are tank cars retrofitted to meet the retrofit standard in § 179.202–13.

[3] Packing Group (as defined in 49 CFR 171.8) is a grouping according to the degree of danger presented by hazardous materials. Packing Group I indicates great danger; Packing Group II, medium danger; Packing Group III, minor danger.

[4] Applies only to tank cars in an HHFT configuration.

[5] Applies to a single tank car containing the denoted commodity.

[6] If these cars are not retrofitted by January 1, 2017 the owners must file a report with the Department on the number of tank cars that they own that have been retrofitted and the number that have not yet been retrofitted.

[7] The FAST Act is applicable to ''unrefined petroleum products in Class 3 flammable service, including crude oil.'' For the purposes of this phase out table, we use ''Crude'' for these materials.

TABLE 1—COMPARISON OF HM–251 TANK CAR PHASE-OUT SCHEDULE VS. FAST ACT PHASE-OUT SCHEDULE—Continued

[Tank cars in Class 3 flammable liquid service]

Tank car type/service	HM–251 phase-out deadline [4]	FAST Act phase-out deadline [5]
Jacketed CPC–1232s	PG II—July 1, 2023 PG III—May 1, 2025 May 1, 2025	Ethanol—July 1, 2023 Flammable PG I—May 1, 2025 ** Flammable PG II/III—May 1, 2029 * Crude oil—May 1, 2025 Ethanol—May 1, 2025 Flammable PG I—May 1, 2025 ** Flammable PG II/III—May 1, 2029 *

** Extendable up to May 1, 2027, if the Secretary finds that insufficient retrofitting shop capacity will prevent the phase-out of tank cars not meeting the DOT–117, DOT–117P, or DOT–117R by the deadline.

* Extendable up to May 1, 2031, if the Secretary finds that insufficient retrofitting shop capacity will prevent the phase-out of tank cars not meeting the DOT–117, DOT–117P, or DOT–117R by the deadline.

The requirements of Section 7304 of the FAST Act differ from the HM–251 final rule in two ways. First, the HM–251 final rule required Class 3 flammable liquids to be transported in DOT–117, DOT–117P, or DOT–117R tank cars only if these tank cars are used in an HHFT, whereas the FAST Act removed the linkage between tank car specification and train composition, instead mandating that any Class 3 flammable liquid be transported in a DOT–117, DOT–117P, or DOT–117R tank car by the dates specified. (The FAST Act does not change the HM–251 final rule's definition of HHFT as it applies to the operational controls specified in the rule.) Second, the phase-out schedule in the HM–251 final rule was based on the PG of the Class 3 flammable liquid, among other factors, whereas the phase-out schedule imposed by the FAST Act is commodity-specific for unrefined petroleum products (including crude oil) and ethanol and based on a commodity's PG only for other Class 3 flammable liquids.

Paragraph (d)(1)(A) of Section 7304 requires the Secretary to take immediate action to revise the date-specific deadlines in the HMR to align with those in the FAST Act. This rule responds to that mandate.

B. Thermal Protection Blanket (FAST Act Section 7305)

Section 7305 of the FAST Act requires tank cars built to meet the DOT–117 specification and each non-jacketed tank car retrofitted to meet the DOT–117R specification be equipped with an ''insulating blanket'' at least half inch thick and approved by the Secretary in accordance with 49 CFR 179.18(c). Paragraph (a) of § 179.18 requires tank cars required to be equipped with thermal protection to be equipped with a thermal protection system meeting a certain performance standard (*i.e.,* a pool fire for 100 minutes; and a torch fire for 30 minutes) and paragraph (b) contains the technical requirements for conducting a thermal analysis to verify a system's compliance with paragraph (a)'s performance standard. As paragraph (c) of § 179.18 indicates, the Department maintains a list of thermal protection systems already verified to meet the performance standard and for which completion of a thermal analysis is not required. PHMSA maintains the list and for a thermal protection system to be added to the list, a manufacturer must first conduct the qualification tests in Appendix B to Part 179 of the HMR. The manufacturer must then provide the test procedures and results to PHMSA, which in consultation with FRA reviews the submitted test procedures and results. If the agencies find that the tests and results demonstrate that the system meets the performance standard of paragraph (a), the thermal protection system is added to the referenced list of tank car thermal protection systems that do not require test verification.

PHMSA notes, that while the FAST Act refers to the blanket as an ''insulating blanket,'' for the purposes of clarity within the HMR, PHMSA is using the term ''thermal protection blanket.'' The FAST Act intends for the blanket to be designed and approved to withstand fire conditions as opposed to being ''insulating material'' that is designed solely to maintain the temperature of the lading during transportation and neither designed nor approved to withstand fire conditions.

The HM–251 final rule did not specifically require that these tank car specifications include a thermal protection blanket as part of the thermal protection system; rather, it required that the specification tank cars meet the performance standard specified in § 179.18 of the HMR, which requires that a tank car have sufficient thermal resistance so that there will be no release of tank car lading, except through the pressure relief device, when subjected to a pool fire for 100 minutes and a torch fire for 30 minutes. Section 179.18 does not require the use of a thermal protection blanket for a tank car that is required to be equipped with thermal protection, nor does it prohibit their usage, provided the thermal protection blanket meets the section's performance requirement. In drafting the HM–251 final rule, PHMSA and FRA projected that a thermal protection blanket would be the likely option chosen for a DOT–117 tank car to comply with the thermal protection requirement, and the use of thermal protection blankets is consistent with the HM–251 Regulatory Impact Analysis (RIA), which assumed the thermal blanket would be the method used to achieve the thermal protection requirements in 179.18.[8] Although PHMSA and FRA acknowledged that new alternate technologies to thermal protection blankets may become available for meeting the performance requirement of that rule, the analysis projected that thermal protection blankets would be the technology of choice and included their cost, along with the removal and replacement of jackets (for jacketed DOT–111 cars), in the retrofit costs.

The FAST Act takes a slightly different approach and instructs the Secretary to require a thermal protection blanket of at least ½-inch-thick material on both cars built to meet the DOT–117 standard and non-jacketed DOT–117R cars. This constitutes a prescriptive standard for a thermal protection blanket that meets the performance standard specified in § 179.18. This rule implements this statutory requirement in conformance with the FAST Act; therefore, a thermal protection blanket meeting § 179.18(c) is now a

[8] *See* HM–251 Final Rule RIA, p. 172–173.

requirement for the DOT–117, as well as for the DOT–117R if the tank car undergoing retrofitting is non-jacketed.

Paragraph (a) of Section 7305 requires the Secretary to amend the HMR to reflect these thermal protection requirements within 180 days of the FAST Act's enactment. This rule responds to that mandate.

C. Top Fittings Protection (FAST Act Section 7306)

Section 7306(a) of the FAST Act specifies minimum requirements for top fittings protection on tank cars built to meet the DOT–117R. The HM–251 final rule did not require top fittings protection as part of the DOT–117R retrofit requirement because the costs involved appeared to be greater than the expected safety benefits.[9] PHMSA noted in the preamble to the HM–251 final rule that a task force of the AAR Tank Car Committee was evaluating potential advancements in existing top fittings protections that could prove cost effective and, along with the FRA, urged industry to consider enhancements that would apply to both new and retrofitted tank cars.

The FAST Act outlines self-executing performance standards for protective housings and pressure relief valves and does not mandate a rulemaking for these requirements. However, the statutory language mandates minimum requirements for top fittings protections for the DOT–117R tank car not currently in the HMR. Codifying these statutorily-mandated minimum requirements in the HMR provides greater clarity for the regulated community and ensures that the HMR is consistent with the FAST Act.

D. International Harmonization

As a result of the FAST Act, the U.S. retrofit schedule for DOT–111 tank cars is more closely aligned with the schedule that Transport Canada has set.[10] Prior to the FAST Act, certain differences existed between the tank car provisions of the HMR and Transport Canada's corresponding Transportation of Dangerous Goods (TDG) Regulations. Specifically, in the HM–251 final rule, the U.S. retrofit schedule was based on several factors, including the Class 3 flammable liquid's PG assignment and tank car construction (*e.g.,* whether the tank car is jacketed or non-jacketed). However, the HM–251 final rule was not commodity-specific; the applicable phase-out date for DOT–111 tank cars transporting crude oil or ethanol in an HHFT could vary significantly depending on the material's PG assignment. For example, under the HM–251 final rule, tank cars transporting PG I crude oil in an HHFT would need to be retrofitted or newly manufactured DOT–117R, DOT–117P, or DOT–117 tank cars at an earlier date than tank cars in an HHFT transporting crude oil assigned to PG II or PG III. Moreover, per the HM–251 final rule, a train transporting crude oil or ethanol but not meeting the definition of an HHFT is not required to utilize retrofitted or newly manufactured tank cars conforming to the DOT–117R, DOT–117P, or DOT–117.

Conversely, Transport Canada implemented a phase-out schedule that was commodity-specific (in addition to consideration of tank car design factors). The TDG Regulations mandate that flammable liquid commodities identified as crude oil or ethanol cannot be transported in a TC/DOT–111 in accordance with Canada's phase-out schedule, irrespective of PG assignment. For example, in order to be used to transport crude oil, TDG Regulations require retrofit of a non-jacketed TC/DOT–111 tank car by Canada's first compliance date (May 1, 2017), regardless of the crude oil's PG assignment. Furthermore, under the TDG Regulations, the TC/DOT–117 applies to a single tank car. Transport Canada's TDG Regulations do not include a definition for an HHFT.

As mandated by the FAST Act, in this final rule, PHMSA is implementing a commodity-specific phase-out schedule for the transport of unrefined petroleum products and ethanol in DOT–111 tanks cars, irrespective of the PG assigned. Moreover, the FAST Act mandates the complete phase out of DOT–111 cars for flammable liquids, as opposed to just tank cars transported in HHFTs. Therefore, with respect to being commodity-specific and the applicability of the new standards to a single tank car, this final rule amends the HMR to further align with Transport Canada's corresponding TDG Regulations. There are, however, still some differences between the HMR and TDG Regulations related to tank car standards and the retrofit schedule. For additional discussion of international harmonization issues, please refer to Subsection K, ''Executive Order 13609 and International Trade Analysis.''

II. Good Cause Justification

PHMSA is issuing this final rule without an opportunity for public notice and comment as is normally provided under the Administrative Procedure Act (APA), 5 U.S.C. 553. The APA authorizes agencies to dispense with certain notice and comment procedures if the agency finds good cause that they are impracticable, unnecessary, or contrary to the public interest. *See* 5 U.S.C. 553(b)(3)(B). In this instance, PHMSA finds that there is good cause to dispense with notice and comment because it would be impracticable and unnecessary.

''Good cause'' exists in impracticable situations when notice unavoidably prevents due and required execution of agency functions or when an agency finds that due and timely execution of its functions would be impeded by the notice otherwise required by the APA. The FAST Act requirements covered in this rulemaking are all non-discretionary, and two of the three FAST Act sections addressed in this rulemaking are self-executing (*see* Sections 7304 and 7306). PHMSA's actions in this final rule merely codify in the HMR these FAST Act requirements based on the authority of the Secretary to implement the statute.[11] This final rule addresses congressional mandates that lay out specific requirements or instruct the Secretary to issue conforming regulatory amendments immediately or soon after the FAST Act's date of enactment. Given the statute's timeline for issuing conforming regulations, PHMSA finds that due and timely execution of agency functions would be impeded by the process of public notice and comment. As such, notice and comment procedures are ''impracticable'' within the meaning of the APA, 5 U.S.C. 553(b)(3)(B). Furthermore, in making these ministerial and technical amendments PHMSA is not exercising discretion in a way that could be informed by public comment. The FAST Act does not provide PHMSA the flexibility to withdraw, change or revise this rule in response to adverse public comment. As such, notice and comment procedures are ''unnecessary'' within the meaning of the APA, 5 U.S.C. 553(b)(3)(B).

This final rule is effective on the day of publication in the **Federal Register**. The APA requires agencies to delay the effective date of regulations for 30 days after publication, unless the agency finds good cause to make the regulations effective sooner. *See* 5 U.S.C. 553(d). In addition to the previously discussed good cause to publish this rulemaking without advance notice and opportunity for public comment to implement the specific and non-discretionary mandates

[9] *See* HM–251 Final Rule, 80 FR at 26676.

[10] Transport Canada is the Canadian equivalent of DOT, with broad oversight authority for all modes of transportation, including the rail transportation of hazardous materials.

[11] The Secretary has delegated this authority to PHMSA. *See* 49 CFR 1.97.

of the FAST Act, PHMSA finds good cause to make the regulations effective prior to 30 days.

The DOT Regulatory Policies and Procedures [44 FR 11034; February 26, 1979] provide that, to the maximum extent possible, DOT operating administrations should provide an opportunity for public comment on regulations issued without prior notice. Per the criteria specified in this policy, PHMSA finds that providing an opportunity for public comment cannot reasonably be anticipated to result in the receipt of useful information. This rule simply implements certain non-discretionary measures of the FAST Act; therefore, PHMSA is unable to adjust the text of the rule to account for any public comment. Section 7304 (expanding the tank car requirements to all flammable liquids) and Section 7306 (requiring top fittings protection) are self-executing and do not technically require regulatory action; Section 7304 (adjusting the retrofit timeline) is non-discretionary and required immediately; and Section 7305 (requiring ½ inch thermal protection) is non-discretionary and required no later than 180 days from the FAST Act's enactment. Further, due to the non-discretionary nature of Sections 7304, 7305, and 7306 of the FAST Act, PHMSA is without authority to withdraw, change or revise this rule in response to adverse public comment. For these reasons, PHMSA is not providing an opportunity for public comment.

III. Section-by-Section Review

Part 173

Section 173.241

Section 173.241 provides the bulk packaging requirements for certain low hazard (*i.e.,* PG III) liquid and solid materials. Specifically, paragraph (a) provides the specifications of rail tank cars that may be used to transport hazardous materials when directed to this section by Column (8C) of the § 172.101 Hazardous Materials Table (HMT). To execute the mandate in Section 7304 of the FAST Act, in this final rule we are revising paragraph (a) to prohibit the use of DOT–111 tank cars (including CPC–1232 tank cars) for Class 3 (flammable liquid) material in PG III, regardless of whether the cars are in HHFT service, unless they meet the DOT–117P performance standard or the DOT–117R retrofit standard. The phase-out must occur by the date in Table 2:

TABLE 2—PHASE-OUT SCHEDULE FOR DOT–111 TANK CARS IN CLASS 3, PG III SERVICE *

Material	Jacketed or non-jacketed tank car	DOT–111 (including cars built to the CPC–1232 standard) not authorized on or after
Class 3, PG III (flammable liquid) material	Jacketed and Non-jacketed	May 1, 2029.

* **Note:** For unrefined petroleum products and ethanol, see Tables 3 and 4 below, as applicable.

Section 173.242

Section 173.242 provides the bulk packaging requirements for certain medium hazard (*i.e.,* PG II and III) liquid and solid materials. Specifically, paragraph (a) provides which specifications of rail tank cars may be used to transport hazardous materials when directed to this section by Column (8C) of the § 172.101 HMT. Consistent with the mandate in Section 7304 of the FAST Act, in this final rule we are revising paragraph (a) to prohibit the use of DOT–111 tank cars for Class 3 (flammable liquids) in PG II and III, regardless of whether the cars are in HHFT service, unless they meet the DOT–117P performance standard or the DOT–117R retrofit standard. The phase-out must occur by the dates in Table 3 according to material type and tank car design factors:

TABLE 3—PHASE-OUT SCHEDULE FOR DOT–111 TANK CARS IN CLASS 3, PG II AND III SERVICE

Material	Jacketed or non-jacketed tank car	DOT–111 Not authorized on or after	DOT–111 Built to CPC–1232 not authorized on or after
Unrefined petroleum products (e.g., crude oil) [12]	Non-jacketed	January 1, 2018	April 1, 2020.
	Jacketed	March 1, 2018	May 1, 2025.
Ethanol	Non-jacketed	May 1, 2023	July 1, 2023.
	Jacketed	May 1, 2023	May 1, 2025.
Other Class 3, PG II and III (flammable liquid) material (other than unrefined petroleum products or ethanol).	Jacketed and Non-jacketed	May 1, 2029	May 1, 2029.

Section 173.243

Section 173.243provides the bulk packaging requirements for certain high hazard (*i.e.,* PG I) liquids and dual hazard materials. Specifically, paragraph (a) provides which specifications of rail tank cars may be used to transport hazardous materials when directed to this section by Column (8C) of the § 172.101 HMT. Consistent with the mandate in Section 7304 of the FAST Act, in this final rule we are revising paragraph (a) to prohibit the use of DOT–111 tank cars for Class 3 (flammable liquids) in PG I, regardless of whether the cars are in HHFT service, unless they meet the DOT–117P performance standard or the DOT–117R retrofit standard. The phase-out must occur by the dates in Table 4 according to material type and tank car design factors:

[12] Unrefined petroleum products refers to hazardous hydrocarbons that are extracted from the earth and have not yet been processed to such an extent that the properties of the product are known and consistent.

TABLE 4—PHASE-OUT SCHEDULE FOR DOT–111 TANK CARS IN CLASS 3, PG I SERVICE

Material	Jacketed or non-jacketed tank car	DOT–111 Not authorized on or after	DOT–111 Built to CPC–1232 not authorized on or after
Unrefined petroleum products (e.g., crude oil)	Non-jacketed	January 1, 2018	April 1, 2020.
	Jacketed	March 1, 2018	May 1, 2025.
Class 3, PG I (flammable liquid) (other than unrefined petroleum products).	Jacketed and Non-jacketed	May 1, 2025	May 1, 2025.

Part 179

Section 179.202–6

Section 179.202–6 requires a tank car built to meet the DOT–117 to have a thermal protection system. Consistent with the mandate in Section 7305 of the FAST Act, in this final rule we are revising this section to require that the thermal protection system include a thermal protection blanket with at least a ½-inch-thick material that meets § 179.18(c).

Section 179.202–11

Section 179.202–11 provides a table of specification requirements for the DOT–117 tank car. Consistent with the mandate in Section 7305 of the FAST Act, in this final rule we are revising the table to make clear that a thermal protection blanket (in accordance with § 179.202–6) is a requirement of the DOT–117 tank car.

Section 179.202–12

Section 179.202–12 provides the performance standards for a DOT–117P tank car. For greater understanding by the regulated community, in this final rule we are revising the heading of § 179.202–12 to more clearly indicate that the performance standard requirements apply to the DOT–117P tank car.

Section 179.202–13

Section 179.202–13 provides performance standards for retrofit of DOT–111 tank cars (*i.e.,* standards for a DOT–117R tank car). Consistent with the mandate in Section 7306 of the FAST Act, in this final rule we are revising the top fittings protection requirements in paragraph (h) to include minimum standards for the protection of pressure relief devices, valves, or fittings.

IV. Regulatory Analyses and Notices

A. Statutory/Legal Authority for This Rulemaking

This final rule is published under the authority of Federal Hazardous Materials Transportation Law (49 U.S.C. 5101 *et seq.*). Section 5103(b) of Federal Hazmat Law authorizes the Secretary to prescribe regulations for the safe transportation, including security, of hazardous material in intrastate, interstate, and foreign commerce.

B. Executive Order 12866, Executive Order 13563, and DOT Regulatory Policies and Procedures

1. Background

As previously discussed, the HM–251 final rule amended the HMR by defining certain trains transporting large volumes of Class 3 flammable liquids as HHFTs and setting forth regulations (*i.e.,* speed restrictions, braking systems, and routing) for their operation. The HM–251 final rule also adopted into the HMR requirements for sampling and testing programs to ensure the proper classification of unrefined petroleum-based products. Furthermore, it codified new tank car design standards and established a phase-out schedule of legacy tank cars (*e.g.,* DOT–111 tank cars) by requiring use of either a DOT–117, DOT–117P, or DOT–117R specification tank car by certain dates for the transport of Class 3 flammable liquids in HHFTs.

The FAST Act instructs the Secretary to make specific regulatory amendments to the aforementioned tank car design standards and phase-out schedule codified in the HM–251 final rule. The FAST Act requirements addressed in this final rule are non-discretionary. This final rule revises the newly adopted regulations in the HM–251 final rule to align with the FAST Act. The specific amendments in this final rule are identified in Table 5 below and discussed briefly in the text that follows. Table 5 summarizes the affected population, costs, and benefits:

TABLE 5—SUMMARY OF AFFECTED POPULATION, COSTS, AND BENEFITS

Need and Basis for the Rule	Congressional Mandate: FAST Act provisions.
Applicability	Rail tank car manufacturers; tank car owners and lessors; railroad operators; shippers, offerors, and rail carriers.
Affected Population	19,757 Flammable Liquid Tank Cars. 73,374 Crude and Ethanol Tank Cars.
Total Costs (7% Discount)	$520 million.
Annualized Costs (7% Discount)	$49 million.
Costs (Qualitative)	Out-of-Service Time.
Benefits (Qualitative)	Improved puncture resistance. Increased thermal survivability. Enhanced protection of top fittings.

Retrofit Schedule

The FAST Act instructs the Secretary to make specific regulatory amendments to the tank car design standards and phase-out schedule established by the HM–251 final rule. Section 7304 of the FAST Act mandates a phase-out of all DOT–111 tank cars used to transport flammable liquids, thereby requiring that these tank cars meet the DOT–117, DOT–117P, or DOT–117R in part 179 of title 49, regardless of train composition. This differs from the HM–251 final rule, which required flammable liquids previously transported in a DOT–111 tank car to be transported in a DOT–117, DOT–117P, or DOT–117R tank car only when these tank cars were configured as part of an HHFT.

Thermal Protection Blankets

Section 7305 of the FAST Act mandates that each tank car built to meet the DOT–117 and each non-jacketed tank car retrofitted to meet the DOT–117R be equipped with a thermal protection blanket of at least ½-inch-thick material that meets § 179.18(c) of the HMR.[13] Under the HM–251 final rule, a thermal protection blanket was not required, but it was an authorized means of providing the required thermal protection for a DOT–117 tank car and in the regulatory impact analysis it was assumed to be the means of compliance that likely would be used by manufacturers.

Top Fittings Protections

Section 7306 of the FAST Act specifies minimum requirements for top fittings protection on tank cars built to meet the DOT–117R—including a protective housing for the top fittings and the pressure relief device—and allows for an alternative protection system. The FAST Act outlines self-executing performance standards for top fittings protection requirements. Codifying these minimum requirements in the HMR provides clarity for the regulated community on the statutory requirements for top fittings.

Executive Orders

Executive Orders 12866 (''Regulatory Planning and Review'') and 13563 (''Improving Regulation and Regulatory Review'') 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.'' This final rule was mandated by congressional action, and the provisions in this action are non-discretionary.

Executive Order 13610 (''Identifying and Reducing Regulatory Burden''), issued May 10, 2012, urges agencies to conduct retrospective analyses of existing rules to examine whether they remain justified and whether they should be modified or streamlined in light of changed circumstances, including the rise of new technologies. DOT believes that streamlined and clear regulations are important to ensure compliance with important safety regulations. As such, DOT has developed a plan detailing how such reviews are conducted.[14]

This final rule is designated as economically significant, and was reviewed by the Office of Management and Budget (OMB). The final rule is considered a significant regulatory action under the Regulatory Policies and Procedures order issued by the DOT [44 FR 11034; February 26, 1979]. In this section, PHMSA addresses the economic impact of this final rule.

2. Need for Rule

The FAST Act instructed the Secretary to make specific regulatory amendments to the aforementioned tank car design standards and phase-out schedule established by the HM–251 final rule. The FAST Act changes adopted in this final rule are non-discretionary. Regardless, the need for the changes adopted in this final rule remains consistent with that in the HM–251 final rule and the HM–251 RIA. Specifically, both the HM–251 final rule and this final rule are designed to lessen the consequences of train accidents involving the unintentional release of flammable liquids. The purpose of the regulations for enhanced tank car standards is to prevent spills by keeping flammable liquids, including crude oil and ethanol, in rail tank cars and to mitigate the severity of incidents should they occur.

Finally, as previously explained, the requirements of Sections 7304, 7305, and 7306 of the FAST Act are non-discretionary and, in some cases, statutorily self-executing, thus superseding the recently published HM–251 final rule. It is good practice to adjust the HMR to align with the current statutory mandates. PHMSA seeks to reduce confusion within the regulated industries and other members of the public by eliminating inconsistency between the statutory mandates and existing regulatory mandates.

3. Baseline/Affected Entities

When examining the cost and budgetary impacts of the provisions in the FAST Act that revise the HM–251 final rule, PHMSA specifically focuses on the cost these changes will impose related to the baseline safety level set by the HM–251 final rule. In other words, the costs considered are only those that are new and add to the previous costs considered in the HM–251 RIA.

Both the HM–251 final rule and this final rule would impact PHMSA stakeholders, including rail tank car manufacturers; tank car owners and lessors; railroad operators; shippers, offerors, and rail carriers; companies that manufacture, transport, or use flammable liquids; and emergency responders. More specifically, owners and lessors of flammable liquid tank cars, shippers of flammable liquids, and railroads that transport flammable liquids would be affected by this rulemaking. Below is a summary of the affected entities for the specific actions adopted in this final rule. Specifically, for this analysis we look at the number of tank cars to gauge impact. We discuss the affected entities separately below because the number varies for each requirement.

Retrofit Schedule

Table 6 is derived from the HM–251 RIA (Table TC2). It represents PHMSA's estimate of the number of DOT–111 and CPC–1232 tank cars that would need to be retrofitted for crude and ethanol service in HHFTs.[15]

TABLE 6—ESTIMATED QUANTITY OF DOT–111 TANK CARS IN NEED OF RETROFIT

Tank car type/service	Fleet size
Non-Jacketed DOT–111 tank cars in PG I service	11,637
Non-Jacketed DOT–111 tank cars in PG II service	18,493
Jacketed DOT–111 tank cars in PG I and PG II service	2,356
Non-Jacketed CPC–1232 tank cars in PG I and PG II service	15,895
Jacketed CPC–1232 tank cars in PG I, PG II service, and all remaining tank cars carrying PG III materials in an HHFT (pressure relief valve and valve handles).	24,933
Total	73,314

The FAST Act modifies the retrofit schedule, accelerating deadlines for unrefined petroleum products in PGII and relaxing the schedule for retrofitting DOT–111 tank cars transporting Class 3 flammable liquids other than unrefined petroleum or ethanol. These modifications to the schedule would neither affect the number of cars retrofitted nor the per unit cost of retrofits, instead only affecting the timing of the retrofits. As a result, the cost differential of this adjustment is a matter of the difference in the value of discounting a year or two for a subset of cars, which is negligible. For this analysis, we assume the same

[13] The HM–251 final rule did not require that these tank car specifications include a thermal protection blanket as part of the thermal protection system, but rather required that the specification tank cars meet the performance standard specified in § 179.18.

[14] Department of Transportation's plan for retrospective regulatory reviews is available online at: *http://www.dot.gov/regulations/dot-retrospective-reviews-rules.*

[15] This only includes crude and ethanol tank cars and assumes a 28 percent retirement rate.

distribution of crude and ethanol tank cars as in Table 6 even though it could be argued that given the current economic conditions these numbers overestimate the needed tank car fleet.[16] Specifically, the number of tank cars in crude oil or ethanol service that need to be retrofit is likely an overestimate due to lower oil prices, expected future additions to the fleet, reduced tank car demand, an existing tank car surplus, decreased fleet utilization rates, and decreased leasing rates. The Progressive Railroading article cited above notes recent changes in the market for tank cars, driven primarily by a substantial drop in crude oil prices, including that tank car utilization has gone from near 100 percent utilization in June of 2014 to 77 percent utilization in 2015, has resulted in a surplus of 80,000 tank cars. Orders for new tank cars have dropped significantly and the current tank car surplus indicates that unless energy prices rebound, tank car utilization will be well below 100 percent, meaning that fewer cars will be needed to haul crude oil than the industry predicted in 2014. In addition, the AAR weekly rail traffic report from May 7, 2016, noted U.S. Class I railroads originated 63,261 carloads of crude oil in the first quarter of 2016, down 21,664 carloads or 25.5 percent from the fourth quarter of 2015 and down 49,828 carloads or 44.1 percent from the first quarter of 2015.[17]

In addition to modifying the retrofit schedule for crude and ethanol tank cars covered in the HM–251 final rule, the FAST Act requires all DOT–111 flammable liquid tank cars to meet the DOT–117/117R tank car specification based on a retrofit timeline. In comments and appeals to the HM–251 final rule, interested parties estimated that approximately 40,000 additional tank cars would need retrofitting if the retrofit requirements were expanded to all flammable liquids. On September 30, 2014, the Railway Supply Institute (RSI) provided a fleet projection for the end of 2015 in their comments to the HM–251 NPRM docket. Table 7 summarizes the RSI projections:

TABLE 7—RSI PROJECTED FLAMMABLE LIQUIDS TANK CAR FLEET AS OF THE END OF 2015

Sub-fleet	Crude oil	Ethanol *	Other flammable liquids *
Non-jacketed DOT–111s	23,090	27,037	24,790
Jacketed DOT–111s	7,016	88	9,413
Non-jacketed CPC–1232s	21,993	751	2,944
Jacketed CPC–1232s	35,408	23	1,975
Totals	87,507	27,899	39,122

* **Note:** Ethanol and Other Flammable Liquids car counts are based on AAR counts of cars that shipped at least one carload of the commodity in question over the period from January 1, 2013 through April 30, 2014. If an individual car switched services during this period, that car will be counted as part of more than one fleet.

In the HM–251 Final Rule RIA, PHMSA assumed that all legacy tank cars would be either retrofit or retired. Retired cars were assumed to be scrapped rather than transferred to other service. The Agency also assumed that any new car built for crude and ethanol service would be a DOT–117 regardless of whether the car was to be used in manifest service or unit train service. The Agency did not assume that CPC–1232 cars would continue to be built for manifest crude and ethanol service. The Agency's reasoning was that any crude or ethanol car would probably end up in HHFT service at some point even if some portion of those commodities would be hauled by manifest trains. The figures in the Crude and Ethanol columns of Table 7 therefore represent the estimated size of the total crude and ethanol fleets, not just the portion of those fleets destined for HHFT service.

PHMSA will continue to evaluate the market conditions that drive industry decisions regarding the tank car fleet. Most recently, the tank car market has seen a growing tank car surplus, along with decreasing fleet utilization rates and decreased leasing rates.[18] [19] Furthermore, as stated in the note to Table 7, for ''Other Flammable Liquids'' [20] (OFL) the car counts are based on AAR counts of cars that shipped at least one carload of the commodity in question over the period from January 1, 2013 through April 30, 2014. This is the same approach to counting tank cars that was utilized in the HM–251 RIA. The concern is that if an individual car switched services (*e.g.,* from ethanol to another flammable liquid) during this period, that car would be counted as part of more than one fleet. In a February 29, 2016, letter to PHMSA, RSI reiterated the difficulty in formulating accurate tank car fleet estimates, particularly when tank cars are likely being shifted between different types of service.[21] As such, we believe that counting tank cars in this manner double counts an individual car if that car switched services during the period. Such double counting may be temporary, however. If the shipping demand increases for crude oil, switching between services may become much less prevalent.

Based on this discussion, PHMSA will continue to use the crude and ethanol fleet size estimated in the HM–251 RIA acknowledging that those tank car numbers may now be an over-estimation. Regarding the additional flammable liquid tank cars that are included in the scope of this rule based on the FAST Act requirements, we are using the RSI estimate as a basis for determining the fleet size but are modifying it based on the factors discussed above (*i.e.,* potential double counting inflating the fleet estimate and falling demand for cars in crude oil service). We estimate the total OFL fleet size is between 20,000 to 30,000 tank cars. We arrived at this estimate by making two adjustments: Remove the Canadian fleet, which was estimated to account for 25.7 percent of cars in the HM–251 final rule RIA (see page 80); and, reduce the remaining U.S. fleet by 10 percent to adjust for double counting due to switching service (as referenced

[16] Progressive Railroading Article: *http://www.progressiverailroading.com/rail_industry_trends/article/Outlook-2016-Rail-car-forecast-by-Richard-Kloster-46701.*

[17] *https://www.aar.org/newsandevents/Press-Releases/Pages/2016-05-11-railtraffic.aspx.*

[18] *See http://www.progressiverailroading.com/virtualmag/pr1215/files/14.html.*

[19] *See http://www.wsj.com/articles/demand-for-key-types-of-railway-cars-falls-amid-declining-output-1429908476.*

[20] ''Other Flammable Liquids'' means any material meeting the definition of a flammable liquid as defined in §§ 172.120 and 173.121 excluding those classified under proper shipping names related to crude and ethanol.

[21] See [insert RSI letter into the docket].

in the note to Table 7 above).[22] This reduction puts the affected OFL fleet estimate in the middle of the 20,000–30,000 range (26,161 in table below). The estimates in Table 8 below were obtained by multiplying the figures in Table 7 by 0.743 (1 − 0.257 = 0.743) and 0.90 (1 − 0.10 = 0.90), sequentially. For the purposes of this analysis, we define the flammable liquid tank car population affected by these provisions as follows in Table 8.

TABLE 8—PHMSA PROJECTED FLAMMABLE LIQUIDS TANK CAR FLEET USED FOR FAST ACT COST DETERMINATION

Sub-fleet	Other flammable liquids
Non-jacketed DOT–111s	16,577
Jacketed DOT–111s	6,294
Non-jacketed CPC–1232s	1,969
Jacketed CPC–1232s	1,321
Total	26,161

PHMSA uses the fleet estimates for OFL in Table 8 as the basis for the cost estimates related to OFL in this rule. While the HM–251 final rule requirements captured OFL that were transported in an HHFT configuration, PHMSA did not expect OFL to be transported in HHFT service therefore no costs or benefits were assigned to those materials in the HM–251 RIA. The key difference between the HM–251 final rule and the FAST Act requirements that are being adopted in this action is that the latter covers all flammable liquid cars regardless of train composition. Therefore, these tank cars are considered in this analysis and will require full retrofits—including not just top fittings protection and thermal protection blankets, but also full height head shields, full jackets, improved bottom outlet valve handles, and high capacity pressure relief valves—to meet the FAST Act requirement that all flammable liquid cars meet the DOT–117R.

Thermal Protection Blankets

The FAST Act requires that each tank car built to meet the DOT–117 and each non-jacketed tank car retrofitted to meet the DOT–117R be equipped with an ''insulating blanket,'' which as clarified above, we have defined here to mean a thermal protection blanket. This requirement is consistent with the assumptions made for meeting the DOT–117R in the HM–251 RIA. Although PHMSA acknowledged that new alternate technologies to existing thermal protection blankets may become available for meeting the performance requirement of that rule, we assumed that the jacketed CPC–1232 cars were equipped with a thermal protection system meeting § 179.18 and there was no associated retrofit cost. Thus, for crude and ethanol cars, thermal protection blanket costs are already accounted for; hence, this FAST Act requirement does not add additional costs for these cars. Neither the FAST Act nor these complying regulations require jacketed cars to be retrofitted with thermal protection, so associated costs would not be borne regardless of the assumptions made in the HM–251 rulemaking analysis.

Section 7305(b) of the FAST act provides a savings clause that states ''[n]othing in this section shall prohibit the Secretary from approving new or alternative technologies or materials as they become available that provide a level of safety at least equivalent to the level of safety provided for under subsection (a).'' As the regulatory text is written, the prescriptive standards for thermal protection blankets are applied for new DOT–117 and DOT–117Rs. The section related to DOT–117Ps is not revised thus if an entity were able to provide a design that exceeded the prescriptive standard for a thermal protection blanket in the FAST act and FRA were to approve that design as a DOT117P they could innovate.

The thermal protection blanketing provision will only affect those non-jacketed flammable liquid cars in need of retrofit. Specifically, we estimate 18,546 tank cars (comprised of the non-jacketed legacy DOT–111 and non-jacketed CPC–1232 tank cars in OFL service listed in Table 8) will be affected.

Top Fittings Protection

The HM–251 final rule did not require modification or addition of top fittings protections to meet the DOT–117R. The FAST Act requires enhanced top fittings protections for all retrofit cars. Tank cars built to the CPC–1232 industry standard are already equipped with top fittings protections; therefore, this new cost only applies to legacy DOT–111 tank cars transporting crude oil and ethanol, as well as those transporting OFL that are now included in our scope per the FAST Act. In total, we estimate 55,357 tank cars (13,905 crude tank cars, 18,581 ethanol tank cars, and 22,871 OFL tank cars) will be affected (see Tables 6 and 8, above).

4. Summary of Costs

PHMSA applies the same retrofit costs that were applied in the HM–251 RIA to all cars being retrofitted (all CPC–1232 tank cars and the DOT–111 tank cars that are not retired). The unit retrofit costs used in the HM–251 RIA are applied to OFL tank cars, along with the estimated cost of installing top fittings protection. The unit costs, including out-of-service time, were estimated at $38,923 for a non-jacketed DOT–111 tank car.[23] The addition of top fittings protection raises this cost to $43,508. For a jacketed DOT–111 tank car, the unit cost of retrofitting in the HM–251 RIA was $28,123. With top fittings protection, this cost rises to $32,708 per car. PHMSA assumes these cars will be retrofitted in the final 5 years of the allowed timeframe (*i.e.,* between 2025 and 2029). Table 10 describes the cost and modifications needed by fleet and tank car type. PHMSA estimates that 76 percent of the total costs of the FAST Act tank car retrofit requirements accrue to the non-jacketed DOT–111 tank cars. In addition, we apply a $4,585 per car cost to account for the cost of enhancing top fittings protection on the legacy DOT–111 tank cars (both jacketed and non-jacketed).[24] The per unit cost for

[22] Starting with the RSI data in Table 7, we sequentially take out 25.7% to remove the Canadian fleet and then take out 10% of the remainder to adjust for double counting due to switching service.

[23] Given the decrease demand for DOT–111 tank cars since the publication of HM–251 final rule, costs associated with out-of-service time may be lower than originally estimated due to underutilization of the fleet.

[24] See RSI letter to PHMSA [add link to docket].

each tank car type is listed below in Table 10 below.

Retirements

As noted above, we assume that 28 percent of OFL tank cars would be retired rather than retrofit. For the HM–251 RIA virtually all retirements were forced early retirements because the retrofit timeline was aggressive, especially for legacy DOT 111 tank cars. The FAST Act deadline is substantially more lenient, and as a result, the Agency believes it appropriate to consider natural retirements as well as forced early retirements. We use the fleet age profile used in the 2015 HM–251 RIA to estimate retirement costs to identify the number of cars in each year from 2016 to 2028 that would reach the end of their useful life. We then assume that the remainders of the 28 percent of retired cars are forced to retire in 2029. Given the longer time horizon for FAST Act compliance the Agency believes this treatment is appropriate. Natural retirements will occur over the nearly decade and a half, and tank car lessors and operators will have more time to plan for moving some of the fleet that is not worth retrofitting into other service rather than scrapping the cars.

We conduct this analysis by assuming, absent FAST Act requirements, that a retired non-jacketed DOT–111 tank car would be replaced with a non-jacketed CPC–1232 and a retired jacketed DOT–111 tank car would have been replaced with a jacketed CPC–1232 tank car. In addition, we assume that industry would have built improved CPC–1232 tank cars for OFL service—with pressure relief valves (PRVs) and bottom outlet valve (BOV) handles that would meet DOT–117 requirements. The non-jacketed cars would (obviously) not have jackets, but would have a 1/2 inch shells and half height head shields. The jacketed cars would have 7/16 inch shells and jackets with thermal protection and top fittings protection. The only difference between these cars and a DOT–117 tank car is an eighth of an inch of shell thickness, which PHMSA estimates to be a $3,000 higher cost for the DOT–117 tank car compared to a jacketed CPC–1232 tank car in the HM–251 Final Rule RIA.[25]

As we found in the development of the HM–251 final rule analysis, tank car purchase prices are difficult to obtain. One way to approximate them is to use modified retrofit costs for upgrading a car from one type to another. As noted, the cost difference between a DOT–117 and a jacketed CPC–1232 is approximately $3,000, because the only difference between the two cars is the thickness of the tank shell. The differential for a non-jacketed CPC–1232 is more complicated because it lacks several components found on the jacketed car. However, the unjacketed CPC–1232 has a thicker shell (1/2 inch rather than 7/16 inches) than the unjacketed CPC–1232 and would therefore only need sixteenth of an inch of shell thickness ($1,500). The non-jacketed CPC–1232 also has half height head shields. To be fully upgraded to the DOT–117 standard, the required additions would be a jacket with full height head shields (rather than half height), thermal protection, and a sixteenth of an inch of shell thickness. The retrofit costs for a non-jacketed CPC–1232 are presented below as a starting point for a new car differential. PHMSA modifies these by:

- Eliminating costs of the BOV and PRV, under the assumption that when done at the manufacturing stage swapping out one part for another would have minimal cost;
- Subtracting $1,000 from the cost of a jacket and head shields to account for repurposing the steel that would have been used for the non-jacketed CPC–1232 half height head shield into half of a full height head shield;
- Adding $1,500 to increase the shell thickness by a sixteenth of an inch (half the cost of increasing the shell thickness of a CPC–1232 by an eighth of an inch); and,
- Increasing the learning curve efficiency to 15 percent because manufacturing efficiencies for new builds should be greater than for retrofits.[26]

TABLE 9—RETROFIT COSTS FOR THE NON-JACKETED, DOT CPC–1232NJ (OPTION 3 TANK CAR) AND NEW CAR DIFFERENTIAL ESTIMATE

Retrofit option	Retrofit cost from HM–251	New car differential cost
Bottom outlet valve handle retrofit cost	$1,200	NA
Pressure relief valve retrofit cost	$1,500	NA
Thermal protection retrofit cost	$4,000	$4,000
Full jacket retrofit cost with half height head shields	$23,400	$22,400
Extra shell thickness	NA	$1,500
Unadjusted Total	$30,100	$27,900
Learning curve cost reduction	10%	15%
Adjusted Total	$27,090	$23,715

This yields a car cost differential of $23,715 between a non-jacketed CPC–1232 tank car and a DOT–117 tank car. We apply this cost to natural retirements to reflect the differential cost between purchasing a non-Jacketed CPC–1232 and a DOT–117. For jacketed DOT–111s that age out of the fleet, we use the cost differential between a jacketed CPC–1232 and a DOT–117 ($3,000). For early retirements, we use the car cost differential plus the cost of having to buy a new DOT–117 earlier than planned—$20,649 for a non-jacketed early retirement and $16,716 for a jacketed car.

We also reassessed the cost of early retirements, which is dependent on the average remaining service life for the cars retired early. For the HM–251 rule this average was 1.9 years for non-jacketed DOT–111s and 1.3 years for jacketed DOT–111s. Due to the overall DOT–111 age distribution, the cars

[25] We assume that these cars would have been built with HM–251 conforming pressure relief valves (PRV) and bottom outlet valve handles (BOV) and FAST Act conforming top fittings protection. We assume that adding better PRV and BOV handle would not add appreciably to the cost of a car when done at the manufacturing stage. As noted above, all CPC–1232 tank cars are built with conforming top fittings protection so that assumption carries through here.

[26] Because components can be added in the most logical and time efficient sequence during the manufacturing process. With the retrofit process certain components may have to be removed to apply thermal protection and a jacket and then reattached.

retired for OFL service have a higher average remaining life. For non-jacketed DOT–111s the average is 2.87 years of remaining life, and for jacketed DOT–111s the average is 2.28 remaining years of life.[27] This raises the early retirement cost for both car types to those presented in Table 10 below. A summary of all OFL cost parameters are presented below.

TABLE 10—UNIT COSTS FOR FAST ACT REQUIREMENTS, OTHER FLAMMABLE LIQUIDS FLEET

Sub-fleet	HM–251 retrofit cost	Top fittings protection cost	Total cost per car
Non-jacketed DOT–111	$38,923	$4,585	$43,508
Jacketed DOT–111	28,123	4,585	32,708
Non-jacketed CPC–1232	28,034	0	28,034
Jacketed CPC–1232	3,374	0	3,374
Non-jacketed DOT–111 Scheduled Retirement			23,715
Jacketed DOT–111 Scheduled Retirement			3,000
Non-jacketed DOT–111 Early Retirement			44,364 (23,715 + 20,649)
Jacketed DOT–111 Early Retirement			19,716 (16,716 + 3,000)

These unit costs are applied to the fleet figures presented in the Table 11 below. For retirements, the cost of natural retirements is applied to the figures in the columns showing retirements for years 2016–2028. Early retirement costs are applied to the 2029 figures in the columns showing retirements. Retrofit costs are estimated by applying the retrofit unit costs above to the corresponding car-type retrofit column in the table below.

TABLE 11—TYPE OF FLAMMABLE LIQUID RETROFIT AND RETIREMENTS BASED ON FAST ACT REQUIREMENTS *

	Retrofit non-jacketed DOT 111	Retrofit jacketed DOT–111	Retrofit non-jacketed CPC 1232	Retrofit jacketed CPC 1232 J	Retire non-jacketed 111	Retire jacketed DOT–111
Baseline	16,577	6,294	1,969	1,321	26,161	.....
Baseline adjusted for retirements **	11,935	4,532	1,969	1,321	4,642	1,762
2016	.....	.....	.....	.....	384	146
2017	.....	.....	.....	.....	261	99
2018	.....	.....	.....	.....	202	77
2019	.....	.....	.....	.....	101	38
2020	.....	.....	.....	.....	129	49
2021	.....	.....	.....	.....	156	59
2022	.....	.....	.....	.....	93	35
2023	.....	.....	.....	.....	156	59
2024	.....	.....	.....	.....	318	121
2025	2,387	906	394	264	374	142
2026	2,387	906	394	264	291	110
2027	2,387	906	394	264	220	84
2028	2,387	906	394	264	202	77
2029	2,387	906	394	264	1,755	666

* FAST Act other flammable liquid retrofit requirements start in 2025 and end in 2029.
** Total of years for each type.

Total cost estimates are presented in Table 12 below. These costs are obtained by applying the unit costs in Table 10 to the fleet figures in Table 11.

TABLE 12—ANALYSIS OF COSTS FOR OTHER FLAMMABLE LIQUID RETROFIT AND RETIREMENTS FOR FAST ACT REQUIREMENTS *

Year	Retrofit non-jacketed 111	Retrofit jacketed 111	Retrofit CPC non-jacketed 1232	Retrofit jacketed CPC–1232	Retire non-jacketed DOT–111	Retire jacketed DOT–111	Total cost
2016	$0	$0	$0	$0	$9,106,560	$438,000	$9,544,560

[27] Years of remaining service life were calculated in the same manner as the HM–251 RIA (See pages 162–163). Due to the differing age distributions of the OFL fleet compared to the crude and ethanol fleets the average remaining life is higher for OFL.

TABLE 12—ANALYSIS OF COSTS FOR OTHER FLAMMABLE LIQUID RETROFIT AND RETIREMENTS FOR FAST ACT REQUIREMENTS *—Continued

Year	Retrofit non-jacketed 111	Retrofit jacketed 111	Retrofit CPC non-jacketed 1232	Retrofit jacketed CPC–1232	Retire non-jacketed DOT–111	Retire jacketed DOT–111	Total cost
2017	0	0	0	0	6,189,615	297,000	6,486,615
2018	0	0	0	0	4,790,430	231,000	5,021,430
2019	0	0	0	0	2,395,215	114,000	2,509,215
2020	0	0	0	0	3,059,235	147,000	3,206,235
2021	0	0	0	0	3,699,540	177,000	3,876,540
2022	0	0	0	0	2,205,495	105,000	2,310,495
2023	0	0	0	0	3,699,540	177,000	3,876,540
2024	0	0	0	0	7,541,370	363,000	7,904,370
2025	103,853,596	29,633,448	11,045,396	890,736	8,869,410	426,000	154,718,586
2026	103,853,596	29,633,448	11,045,396	890,736	6,901,065	330,000	152,654,241
2027	103,853,596	29,633,448	11,045,396	890,736	5,217,300	252,000	150,892,476
2028	103,853,596	29,633,448	11,045,396	890,736	4,790,430	231,000	150,444,606
2029	103,853,596	29,633,448	11,045,396	890,736	77,858,820	13,130,856	236,412,852
					Non-discounted Total		889,858,761
					NPV 7% Discount Rate		405,750,881
					NPV 3% Discount Rate		629,195,653

* FAST Act other flammable liquid retrofit requirements start in 2025 and end in 2029.

For the cars already accounted for in the HM–251 RIA, the only additional cost is to modify top fittings protection for the DOT–111 tank cars. As previously stated, PHMSA assumed in the HM–251 RIA that thermal protection blankets would be used to satisfy the thermal protection requirements in the HM–251 final rule and acknowledges that tank cars built to the CPC–1232 standard are equipped with top fittings protection meeting the requirements of the FAST Act. As mentioned above, we assume a unit cost of $4,585 per car for this modification. Table 13 presents the costs of further modifying these cars. Again, discounted NPV is calculated by setting 2016 as year 1.

TABLE 13—COST FOR CRUDE AND ETHANOL RETROFIT BASED ON FAST ACT REQUIREMENTS

Year	Non-jacketed DOT–111	Jacketed DOT–111	Total
2016	$20,233,605	$0	$20,233,605
2017	33,122,040	3,287,445	36,409,485
2018	0	7,225,960	7,225,960
2019	0	0	0
2020	22,938,755	0	22,938,755
2021	40,068,315	0	40,068,315
2022	23,273,460	288,855	23,562,315
2023	90,554	0	90,554
Non-discounted Total	139,726,729	10,802,260	150,528,989
NPV 7%	105,440,453	8,949,802	114,390,255
NPV 3%	123,203,667	9,946,375	133,150,042

As summarized in Table 14, total discounted costs for all provisions are about $520 million over 20 years at a 7 percent discount rate and $762 million at a 3 percent discount rate. The potential benefits of these changes are discussed further below.

TABLE 14—TOTAL COSTS OF FAST ACT REQUIREMENTS (20 YEAR AND ANNUALIZED)

Cost category	NPV 3%	NPV 7%
Cost for Crude and Ethanol Retrofit (20 Year)	$133,150,042	$114,390,255
Cost for Flammable Liquid Retrofit and Retirement (20 Year)	629,195,653	405,750,881
Total (20 Year)	762,345,695	520,141,136
Annualized Cost	51,241,605	49,097,644

PHMSA has made a number of assumptions regarding the cost of these requirements, including the following:

- Tanks cars built to the CPC–1232 industry standard are equipped with top fittings protection that conforms to the FAST Act requirement, and therefore would not need top fittings-related retrofits due to the FAST Act requirement.
- Adding new top fittings protection that conforms to the FAST Act would not add

significant weight to cars, and hence PHMSA does not estimate any additional track maintenance and fuel consumption costs for cars on which top fittings are modified.

• The analysis does not account for the fuel and track maintenance costs for the OFL tank car retrofits. These retrofits occur near the end of the 20-year analysis period; hence, any fuel and maintenance costs would only accrue for a few years and would be heavily discounted.

• The analysis assumes the same 28 percent retirement rate for OFL tank cars as was assumed for the crude and ethanol cars in the HM–251 RIA but considers both natural and forced early retirements.

• Adding top fittings protection would not affect the retirement decision (*i.e.,* adding top fittings protection to crude, ethanol, or OFL tank cars would not result in retirement of a higher proportion of these cars).

• The size of the crude oil fleet remains unchanged despite the recent drop in crude oil production and shipments by rail, which is expected to persist at least in the near term.

• OFL service cars would be replaced with a CPC–1232 in the absence of this regulation (and the Fast Act), since the rail industry supported plans to build jacketed CPC–1232 cars and began to build them for crude and ethanol service prior to the promulgation of the HM–251 final rule.[28] As a sensitivity analysis below, we assess costs assuming OFL service cars would be built to the higher DOT–117 standards promulgated in the HM–251 final rule in absence of this rule.

The estimated retrofit costs of the rule, by provision, are presented in Table 15 below. The costs in this table exclude retirement costs.

TABLE 15—ESTIMATED NON-DISCOUNTED COST BREAKDOWN OF THE FAST ACT TANK CAR RETROFIT REQUIREMENTS

Service type	Tank car type	Modification needed	Tank cars impacted[29]	Cost per tank car	Discounted[30] total cost (thousands)	% of total costs
Crude and Ethanol	Non-jacketed DOT–111	Thermal Blanket[31] ..... Top Fittings Protection.	30,475	$4,585	$105,440,453	25
	Jacketed DOT–111	Top Fittings Protection	2,356	4,585	8,949,802	2
	Non-jacketed CPC–1232.	Thermal Blanket	15,895	NA	0	0
	Jacketed CPC–1232 ...	.....	24,993	NA	0	0
Flammable Liquid[32]	Non-jacketed DOT–111[33].	Tank Retrofit ..... Thermal Blanket. Top Fittings Protection.	11,425	43,508	231,618,001	52
	Jacketed DOT–111[34]	Tank Retrofit ..... Top Fittings Protection.	4,335	32,708	66,089,575	15
	Non-jacketed CPC–1232.	Tank Retrofit ..... Thermal Blanket.	1,885	28,034	24,633,837	6
	Jacketed CPC–1232 ...	Tank Retrofit	1,265	3,374	1,986,551	0.4

5. Sensitivity Analysis of Costs

In the above analysis, the cost applied to early retirements is based on the industry continuing to build CPC–1232 cars (both jacketed and unjacketed) for OFL service. Industry could also build to the higher DOT–117 standards when replacing retired OFL service cars. We consider an alternative cost analysis that assumes industry voluntarily replaces retired legacy cars with DOT–117s based on the following:

• The industry was already ordering DOT–117 tanks cars for crude and ethanol service prior to publication of the final rule.[35]

• Replacing retired cars with a DOT–117 tank car would enable tank car owners and leasers to switch cars between crude, ethanol, and OFL service, thereby ensuring fuller utilization in periods where demand wanes in one segment of the industry and demand in another service is high.

This sensitivity analysis assumes that natural retirements are replaced with DOT–117s at no additional cost and costs applied to early retirements are the costs associated with buying a car earlier than planned. The unit costs associated with this sensitivity analysis are presented in Table 16 below.

TABLE 16—UNIT COSTS USED IN SENSITIVITY ANALYSIS OF FAST ACT REQUIREMENTS, OTHER FLAMMABLE LIQUIDS FLEET

Sub-fleet	HM–251 retrofit cost	Top fittings protection cost	Total cost per car
Non-jacketed DOT–111	$38,923	$4,585	$43,508
Jacketed DOT–111	28,123	4,585	32,708
Non-jacketed CPC–1232	28,034	0	28,034

[28] Jacketed CPC–1232 tank cars have been built for OFL service. PHMSA estimates that approximately 2,000 of these tank cars are currently used in this service on a quarterly basis. See also American Chemistry Council (ACC) comments from 2014 at *https://www.regulations.gov/document?D=PHMSA-2012-0082-0219.* ACC stated ''that the chemical industry has been purchasing tank cars built to the CPC 1232 standard for several years and they support provisions that would require all new DOT 111 tank cars to meet the CPC 1232 standard with the exception of thermal protection. ACC noted that thermal protection should be considered a commodity specific addition that is not appropriate in all cases''.

[29] Numbers are derived from Table 25 for crude and ethanol and Table 47 for flammable liquids from the RIA.

[30] These costs are NPV discounted at 7%.

[31] PHMSA assumed that to meet the performance standard specified in § 179.18 each tank car built to meet the DOT–117 specification and each non-jacketed tank car retrofitted to meet the DOT–117R specification would do so using a thermal protection blanket; thus no cost for thermal protection blankets is added for the fleet included in the HM–251 scope.

[32] Costs associated with retiring older OFL tank cars are not incorporated into this table, but are incorporated in the figures presented elsewhere in this section (see Table 11).

[33] Includes retirement costs.

[34] Includes retirement costs.

[35] See *http://www.railwayage.com/index.php/mechanical/freight-cars/tank-car-of-the-future-among-greenbrier-railcar-contracts.html.*

TABLE 16—UNIT COSTS USED IN SENSITIVITY ANALYSIS OF FAST ACT REQUIREMENTS, OTHER FLAMMABLE LIQUIDS FLEET—Continued

Sub-fleet	HM–251 retrofit cost	Top fittings protection cost	Total cost per car
Jacketed CPC–1232	3,374	0	3,374
Non-Jacketed DOT–111 Scheduled Retirement			0
Jacketed DOT–111 Scheduled Retirement			0
Non-jacketed DOT–111 Early Retirement			20,649
Jacketed DOT–111 Early Retirement			16,716

We applied these costs to the OFL fleet retrofit and retirement schedule presented above. Table 17 summarizes costs for the OFL fleet using the alternative baseline as a sensitivity analysis. Table 18 summarizes the total cost of the rule using the alternative baseline and includes costs associated with retrofitting the crude and ethanol fleet with top fittings protection. This sensitivity analysis found the cost of the rule to be about 12 percent less if industry were to build DOT–117 tank cars rather than CPC–1232 tank cars in absence of the FAST Act.

TABLE 17—SENSITIVITY ANALYSIS OF COSTS FOR FLAMMABLE LIQUID RETROFIT AND RETIREMENTS BASED ON FAST ACT REQUIREMENTS

Year	Retrofit non-jacketed 111	Retrofit jacketed 111	Retrofit CPC non-jacketed 1232	Retrofit jacketed CPC–1232	Retire non-jacketed DOT–111	Retire jacketed DOT–111	Total cost
2016	$0	$0	$0	$0	$0	$0	$0
2017	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0
2025	103,853,596	29,633,448	11,045,396	890,736	0	0	145,423,176
2026	103,853,596	29,633,448	11,045,396	890,736	0	0	145,423,176
2027	103,853,596	29,633,448	11,045,396	890,736	0	0	145,423,176
2028	103,853,596	29,633,448	11,045,396	890,736	0	0	145,423,176
2029	103,853,596	29,633,448	11,045,396	890,736	36,238,995	11,132,856	192,795,027
					Non-discounted Total		774,487,731
					NPV 7% Discount Rate		342,699,585
					NPV 3% Discount Rate		541,748,518

TABLE 18—SENSITIVITY ANALYSIS OF COSTS FOR FAST ACT REQUIREMENTS (20 YEAR AND ANNUALIZED)

Cost category	NPV 3%	NPV 7%
Cost for Crude and Ethanol Retrofits (20 Year)	$133,150,042	$114,390,255
Cost for Other Flammable Liquid Retrofit and Retirement (20 Year)	541,748,518	342,699,585
Total Discount Cost (20-Year)	674,898,561	457,089,840
Annualized Cost	45,363,784	43,146,047

6. Summary of Benefits

The implementation of this final rule ensures that all Class 3 flammable liquids are packaged in tank cars meeting improved specifications, thus reducing the likelihood that a train transporting any volume of flammable liquids will release such liquids should it derail. This final rule also reduces the consequences of an incident should one occur by diminishing the number of tank cars likely to be punctured and the subsequent release of flammable liquids in a derailment. The goals of this rule are thus consistent with those of the HM–251 final rule. Specifically, both the HM–251 final rule and this final rule are designed to lessen the consequences of train accidents involving the unintentional release of flammable liquids. The main difference is that this rule is simply intended to align the HMR with the non-discretionary mandates of the FAST Act. The purpose of the regulations for enhanced tank car standards is to prevent spills by keeping flammable liquids, including crude oil and ethanol, in rail tank cars and to mitigate the severity of incidents should they occur. Below we qualitatively discuss the benefits of each requirement addressed in this rule individually and provide a final discussion of the combined benefits of the provisions.

Retrofit Schedule

The FAST Act mandates a new phase-out schedule for DOT–111 tank cars—including DOT–111 tank cars constructed to the CPC–1232 industry standard—used to transport unrefined petroleum products (*e.g.,* petroleum crude oil), ethanol, and other Class 3 flammable liquids, irrespective of train composition. We estimate that the FAST Act's phase-out schedule impacts approximately 25,000 tank cars. With regard to benefits, these 25,000 tank cars will realize improved puncture resistance, enhanced thermal survivability, and increased top fittings protection. While these 25,000 tank cars would not travel in large blocks of cars like HHFTs, they would see benefits in potentially avoiding releases.

Thermal Protection Blankets

The FAST Act mandates that each tank car built to meet the DOT–117 standard and each non-jacketed tank car retrofitted to meet the DOT–117R standard be equipped with a thermal protection blanket with at least ½-inch-thick material that meets § 179.18(c). In the HM–251 final rule, PHMSA required all cars in HHFT service be equipped with an 11-gauge jacket but did not require a particular thermal protection material or thickness, instead requiring that a thermal protection system (which includes a pressure relief device) meet the performance standard of § 179.18. Although PHMSA acknowledged that alternative technologies to thermal protection blankets exist (*e.g.,* intumescent paint) and that others may become available for meeting the performance requirement of that rule, PHMSA assumed that thermal protection blankets would be the technology of choice and proactively included their cost in the retrofit costs. Thus, for crude and ethanol cars, thermal protection blanket benefits are already accounted for; hence, this FAST Act requirement does not add additional retrofit benefits for these cars. The FAST Act does add thermal protection blankets to other tank cars used for OFL. Consequently the entire flammable liquid fleet will now realize benefits from this requirement.

A thermal protection blanket provides benefits in the form of thermal protection, which prevents the temperature of the tank car from reaching 800 °F, the temperature at which the shell becomes malleable and its mechanical properties degrade. At temperatures above 800 °F, the shell will thin as a result of the hoop stress caused by the increasing pressure in the tank. After a period of time with excessive pressure, the thinning wall will fracture and result in a failure of the tank.

As established in § 179.18 of the HMR, a thermal protection system serves to prolong the survivability of a tank exposed to a pool or torch fire by limiting the heat flux into the tank material and its lading, thereby delaying the increase of pressure in the tank. The National Transportation Safety Board (NTSB) has acknowledged that the absence of adequate thermal protection could lead to a higher likelihood of release and thermal tearing of tank cars.[36] Conversely, the presence of adequate thermal protection (*i.e.,* a thermal protection blanket) should lead to a lower likelihood of these events.

Top Fittings Protection

The HM–251 final rule did not require top fittings protections to meet DOT–117R. The FAST Act requires enhanced top fittings protection for all retrofitted cars. The top fittings protection consists of a structure of specific design requirements intended to minimize damage to the service equipment. Top fittings protection will minimize the shearing off of and damage to valves and fittings on the top of the tank car when involved in a derailment scenario. The NTSB has acknowledged that the absence of top fittings could lead to a higher likelihood of release.[37] The benefits of top fittings protection will now be realized by the entire flammable liquid fleet.

Combined and Quantified Benefits

The FAST Act mandates a new phase-out schedule for DOT–111 tank cars—including DOT–111 tank cars constructed to the CPC–1232 industry standard—used to transport unrefined petroleum products (*e.g.,* petroleum crude oil), ethanol, and other Class 3 flammable liquids, irrespective of train composition. In addition, the FAST Act mandates that each tank car built to meet the DOT–117 and each non-jacketed tank car retrofitted to meet the DOT–117R be equipped with a thermal protection material having a minimum ½-inch thickness that meets § 179.18(c). Furthermore, the FAST Act specifies minimum top fittings protection requirements for tank cars retrofit to meet the DOT–117R.

As previously mentioned, the HM–251 final rule required Class 3 flammable liquids to be transported in a DOT–117, DOT–117P, or DOT–117R tank car only if these tank cars were configured as part of an HHFT. The FAST Act instructed the Secretary to require that all Class 3 flammable liquids be transported in either a DOT–117, DOT–117P, or DOT–117R tank car, whether or not the flammable liquid is transported as part of an HHFT. Applying these requirements to individual tank cars expands the scope of the impacted tank cars, which will reduce the overall probability and quantity of a Class 3 hazardous liquid material release and will minimize the consequences of an incident should one occur, including deaths and injuries.

In the HM–251 RIA, PHMSA addressed the risks posed by unit trains or trains with large blocks of tank cars containing flammable liquids. The FAST Act modifies the retrofit schedule, accelerating deadlines for unrefined petroleum products in PGII and relaxing the schedule for retrofitting DOT–111 tank cars transporting Class 3 flammable liquids other than unrefined petroleum or ethanol. Consistent with the FAST Act, this rule requires that all tank cars used to transport Class 3 flammable liquids meet either the DOT–117, DOT–117P, or DOT–117R in part 179 of the HMR, irrespective of train composition.

Enhancing crude and ethanol tank cars with better top fittings protection, and all flammable liquid tank cars on manifest trains with top fittings protection, jackets, thermal protection systems, full height head shields, and better outlet valves, will reduce the likelihood of release in the event of a derailment. As a result, fewer car punctures and fewer releases of material will occur, thereby mitigating the associated damages. This rule is therefore expected to reduce the damages to society associated with release of Class 3 flammable liquids in rail transportation.

The benefits of applying these requirements to trains carrying large quantities of crude and ethanol (*i.e.,* HHFTs) were estimated in the HM–251 final rule RIA, though those estimated benefits do not include the benefit of improved top fittings protection for tank cars that are retrofit. As noted in that document, the estimated effectiveness rates do not include any benefits from additional top fittings protection, because those benefits are relatively small and uncertain and would apply only to new construction (HM–251 RIA page 184). As a result, we did not estimate benefits of top fittings protection for the cars and fleet covered in this final rule based on the prior HM–251 analysis. PHMSA focusses the following benefits discussion and estimation for this final rule on

[36] *http://www.ntsb.gov/safety/safety-recs/recletters/R-15-014-017.pdf.*

[37] *http://www.ntsb.gov/safety/safety-recs/recletters/R-12-005-008.pdf.*

requirements for tank cars carrying flammable liquids on manifest trains only to comply with the 117, 117P, or 117R specification.

PHMSA assumes the upgrades to the OFL cars produce identical effectiveness to those estimated in the HM–251 analysis for a comparable car upgrade—*i.e.* upgrading or replacing a non-jacketed DOT–111 would reduce the probability of release by an equivalent amount whether the car is hauling crude, ethanol, or some OFL. Given the variation of the properties of materials within this packing group this assumption may or may not be valid. Some materials may have different flash points or other properties that enhance or reduce risk, when compared to crude or ethanol. In addition, some of these products, such as acrylonitrile stabilized, if ignited, produce fumes or smoke while burning that is far more toxic than those produced by crude and ethanol. Thus, for some packing group 3 materials, a fire resulting from a release that is ignited may pose much higher risks of injury to nearby populations than a crude or ethanol fire would pose. OFL products, such as paint, may pose lower risk of injury to nearby populations than a crude or ethanol fire would pose.

Challenges and Data Limitations

The wide variety of materials within Packing Group 3 poses a challenge to monetizing benefits for OFL. There are over 500 Class 3 materials, and the properties of these materials vary widely. Although the flammable properties of these materials may be similar to crude and ethanol, the type and extent of contamination of the natural or human environment that results from accidental release may be completely different, depending on the commodity involved. In addition, even if the flammable properties of the liquids were identical, the average spill size of the incidents affected by this rule is substantially smaller than the average spill size of incidents involving HHFTs (7,027 gallons compared to 84,000 gallons). Given uncertainties about fixed and variable costs of spills, PHMSA may not be able to produce valid per gallon cost estimates for a roughly 7,000 gallon spill based on the HHFT rule estimates. We do not believe it is meaningful to use the per gallon spill cost estimates developed in the HM–251 analysis to monetize damages and costs of the releases affected by this rule since those estimates were based on research and data involving crude and ethanol spill damages. As a result, we do not monetize benefits for this final rule. We instead present a break-even analysis that identifies how large the per gallon cost or damage of a spill would need to be for this rule's benefits to equal its costs. We do this by estimating the likely number of events that may occur over the analysis period, the likely average size of these events, and by assuming that the mitigation of the size of events that will result if all OFL tank cars are upgraded to the DOT–117R standard or replaced with new DOT–117 cars is the same as the mitigation levels estimated in the HMR–251 final rule's regulatory impact analysis for tank cars used on HHFTs.

Incident History

PHMSA identified train derailments that involved OFL products over the last decade for which data is complete (2006–2015), and presents this data in the table below (ordered by date). This table presents the average release and damages reported in incident report forms. We found 54 events over the past ten years resulting in a total quantity released of 379,464 gallons. Based on this dataset, the average spill size is 7,027 gallons. This is much smaller than the average crude/ethanol spill, which was estimated at 83,602 gallons.

TABLE 18—SUMMARY OF CLASS 3 HAZARDOUS MATERIAL DERAILMENTS WITH RELEASE INVOLVING OTHER FLAMMABLE LIQUIDS, EXCLUDING CRUDE OIL AND ETHANOL

[2006–2015]

Year	Total number of incidents	Total gallons released	Average of quantity released (gallons)	Sum of reported damages ($) *
2006	3	124	41	$99,565
2007	11	117,300	10,664	6,465,335
2008	3	6,132	2,044	187,350
2009	6	17,350	2,892	1,416,713
2010	5	56,390	11,279	2,844,842
2011	4	28,339	7,086	1,575,490
2012	8	105,400	13,175	6,959,474
2013	8	13,703	1,713	10,842,912
2014	4	14,726	3,681	2,558,530
2015	2	20,000	10,000	263,476
Total	54	379,464	** 7,027	33,213,687

* Damages as reported on the DOT form 5800.1. It should be noted PHMSA did not have a record of any fatalities in this time period. These may not include all actual damages, such as costs to the environment and valuations for injuries.

** This average is calculated by totaling all release data and dividing by total number of incidents in the last 10 years (it is not the average of averages).

Forecasting Future Events

A valid way to predict the number of future derailment events would be to look at the rate of events per volume shipped, potentially also controlling for other factors, over a number of years and project that rate forward based on a forecast of future volume shipped. This was how PHMSA projected future derailments in the HM–251 RIA. However, PHMSA was not able to develop such a forecast for OFL due to resource and data limitations. We would need to map each commodity, in the table of derailments above, to the corresponding Waybill Sample Standard Transportation Commodity Code (STCC Code) in order to obtain the volume of Class 3 flammable liquids shipped by rail per year. In addition, while production forecasts for energy products are available, no such forecast is available for the vast majority of OFL products. Thus, even if PHMSA did estimate a volume-based incident rate, there is no future volume forecast to

which this rate can be applied to obtain a forecasted number of events.

As a result, PHMSA uses a basic model to project future events: we calculate the number of events over 10 past years and project that ''rate'' forward for the 20-year analysis period. Specifically, we note that 54 events occurred over ten years. The 20-year analysis period is twice as long as the 10-year historic period evaluated, so PHMSA simply multiplies the 54 events by two to obtain an estimate of 108 future release events over 20 years. We spread these events equally over the 20-year analysis period at 5.4 releases per year.

Event Size and Total Annual Release Estimate

The 54 events analyzed produced a total quantity spilled of 379,464 gallons of product released, resulting in an average of 7,027 gallons of product released per incident. Combining this figure with the forecasted number of events above (5.4 releases per year) provides an estimated average annual volume of 37,946 gallons released per year (5.4 releases per year multiplied by 7,027 gallons per release). We note that one OFL incident involved a large number of injuries—56 requiring hospitalization and another 139 requiring treatment but no hospitalization—and this incident involved a release from a DOT–105 tank car. This incident was not included in the incident table above because the OFL product was not shipped in a DOT–111. A second event involving the same material, acrylonitrile stabilized, this time in a DOT–111, resulted in 4 non-hospitalized injuries. Such events are evidence of the wide variety of materials being shipped and the different risks they pose to human health and the environment. This particular substance is toxic in addition to being flammable, and hence produces toxic fumes when burned. As a result, medical attention is necessary to treat anyone exposed to the fumes released by fires involving this product. Although the typical release involving OFL is small, for some substances in this hazard class, the impacts on people and the environment may be substantially more severe than for crude and ethanol. For other products the impacts may be fairly benign.

Estimated Reduction in Quantity of OFLs Released

In order to estimate the reduction in product released as a result of upgrading OFL tank cars to the DOT–117R/117 standard, PHMSA followed the same procedure and used the same effectiveness rates used in the HM–251 analysis. We calculated the ratio of each car type upgraded by a given year as a percentage of the total OFL fleet. The table of these calculations is presented below.

TABLE 19—OTHER FLAMMABLE LIQUID FLEET UPGRADE SHARE BY CAR TYPE

Year	111NJ to 117R %	111J to 117R %	1232NJ to 117R %	1232J to 117R %	111NJ to 117 %	111J to 117 %
2016	0.00	0.00	0.00	0.00	1.47	0.56
2017	0.00	0.00	0.00	0.00	2.47	0.94
2018	0.00	0.00	0.00	0.00	3.24	1.23
2019	0.00	0.00	0.00	0.00	3.62	1.38
2020	0.00	0.00	0.00	0.00	4.12	1.56
2021	0.00	0.00	0.00	0.00	4.71	1.79
2022	0.00	0.00	0.00	0.00	5.07	1.92
2023	0.00	0.00	0.00	0.00	5.66	2.15
2024	0.00	0.00	0.00	0.00	6.88	2.61
2025	9.12	3.46	1.51	1.01	8.31	3.15
2026	18.25	6.93	3.01	2.02	9.42	3.57
2027	27.37	10.39	4.52	3.03	10.26	3.90
2028	36.50	13.85	6.02	4.04	11.04	4.19
2029	45.62	17.32	7.53	5.05	17.74	6.74
2030	45.62	17.32	7.53	5.05	17.74	6.74
2031	45.62	17.32	7.53	5.05	17.74	6.74
2032	45.62	17.32	7.53	5.05	17.74	6.74
2033	45.62	17.32	7.53	5.05	17.74	6.74
2034	45.62	17.32	7.53	5.05	17.74	6.74
2035	45.62	17.32	7.53	5.05	17.74	6.74

These figures are multiplied by the corresponding effectiveness rate as pulled from the HM–251 analysis, reproduced below.

TABLE 20—HM–251 EFFECTIVENESS RATES

	Percent
Effectiveness Rates, Enhanced Jacketed CPC	
111 non-jacketed to 1232 w jacket	45.9
CPC non-jacketed to jacketed	31.0
111 jacketed to CPC jacketed	37.6
CPC jacketed to CPC jacketed	1.0
Effectiveness Rates, New DOT–117	
111 non-jacketed to AAR 2014	50.4
CPC non-jacketed to AAR 2014	36.8
111 jacketed to AAR 2014	42.8

TABLE 20—HM–251 EFFECTIVENESS RATES

	Percent
jacketed 1232 to AAR 2014	16.2

As a reminder, a retrofit tank car cannot be equipped with a thicker shell, so the DOT 117R standard is the equivalent of a jacketed CPC–1232 with some modest improvements—specifically an improved high capacity pressure relief valve and a bottom outlet valve design that reduces the probability of damage during derailment. Therefore, legacy DOT–111 tank cars that are retrofit improve by the factor represented by the ''Effectiveness Rates, Enhanced Jacketed CPC'' rows in the table above. These effectiveness rates can be interpreted as reductions in the probability that a tank car will release in a derailment, or the reductions in the expected amount of release product in a derailment. For cars that are retired and replaced with a new tank car, the effectiveness rates includes all the retrofit components—jacket, thermal protection, full height head shields, etc., but also an increase in shell thickness to 9/16'', which further reduces the probability of release. A retired and replaced tank car therefore experiences the higher effectiveness rate presented in the ''Effectiveness Rates, New DOT–117'' rows in the table above. The products of the upgrade shares by type and the effectiveness rates are summed across rows to obtain an effectiveness rate for the OFL fleet upgrades. The individual effectiveness products and total effectiveness rate are produced in the table below.

TABLE 21—TOTAL EFFECTIVENESS RATES BY CAR TYPE AND TYPE OF UPGRADE *

Year	111NJ to 117R %	111J to 117R %	1232NJ to 117R %	1232J to 117R %	111NJ to 117 %	111J to 117 %	Total effectiveness %
1	0.00	0.00	0.00	0.00	0.74	0.24	0.98
2	0.00	0.00	0.00	0.00	1.24	0.40	1.64
3	0.00	0.00	0.00	0.00	1.63	0.53	2.16
4	0.00	0.00	0.00	0.00	1.83	0.59	2.42
5	0.00	0.00	0.00	0.00	2.07	0.67	2.74
6	0.00	0.00	0.00	0.00	2.38	0.77	3.14
7	0.00	0.00	0.00	0.00	2.55	0.82	3.38
8	0.00	0.00	0.00	0.00	2.86	0.92	3.77
9	0.00	0.00	0.00	0.00	3.47	1.12	4.59
10	4.19	1.30	0.47	0.01	4.19	1.35	11.51
11	8.38	2.60	0.93	0.02	4.75	1.53	18.21
12	12.56	3.91	1.40	0.03	5.17	1.67	24.74
13	16.75	5.21	1.87	0.04	5.56	1.79	31.22
14	20.94	6.51	2.33	0.05	8.94	2.88	41.66
15	20.94	6.51	2.33	0.05	8.94	2.88	41.66
16	20.94	6.51	2.33	0.05	8.94	2.88	41.66
17	20.94	6.51	2.33	0.05	8.94	2.88	41.66
18	20.94	6.51	2.33	0.05	8.94	2.88	41.66
19	20.94	6.51	2.33	0.05	8.94	2.88	41.66
20	20.94	6.51	2.33	0.05	8.94	2.88	41.66

* Some values may not total due to rounding.

The overall effectiveness rate for upgrading the OFL fleet is higher than that estimated for the crude and ethanol fleet. CPC–1232s make up a smaller portion of the OFL fleet than the crude and ethanol fleet and upgrading legacy DOT–111s produces a greater estimated reduction in the quantity of product released than the more marginal improvements to CPC–1232 cars. However, the retrofit schedule for the OFL fleet is less aggressive than the schedule for the crude and ethanol fleet, and the quantity of product released in these incidents is likely to be much smaller than is typical of crude and ethanol incidents. In the table below, the overall effectiveness rate for upgrading the OFL fleet is multiplied by the expected release quantity per year to obtain a yearly reduction in OFL material released.

TABLE 22—PREDICTED PREVENTED SPILL VOLUME *

Year	Number of events	Gallons released	Effectiveness	Reduction in gallons released **
1	5.4	37,946	0.98	371
2	5.4	37,946	1.64	624
3	5.4	37,946	2.16	819
4	5.4	37,946	2.42	917
5	5.4	37,946	2.74	1,041
6	5.4	37,946	3.14	1,192
7	5.4	37,946	3.38	1,282

TABLE 22—PREDICTED PREVENTED SPILL VOLUME *—Continued

Year	Number of events	Gallons released	Effectiveness	Reduction in gallons released **
8	5.4	37,946	3.77	1,432
9	5.4	37,946	4.59	1,740
10	5.4	37,946	11.51	4,366
11	5.4	37,946	18.21	6,911
12	5.4	37,946	24.74	9,388
13	5.4	37,946	31.22	11,848
14	5.4	37,946	41.66	15,809
15	5.4	37,946	41.66	15,809
16	5.4	37,946	41.66	15,809
17	5.4	37,946	41.66	15,809
18	5.4	37,946	41.66	15,809
19	5.4	37,946	41.66	15,809
20	5.4	37,946	41.66	15,809
Total	.....	.....	.....	152,592

* Some values may not total due to rounding.
** These non-monetized estimates are not discounted. OMB and EPA guidelines discuss options for discounting non-monetized effects such as environmental damages to convey effects felt farther in the future are worth less in today's term than those occurred earlier in time (OMB Circular A–4, 2003, Page 36; and, EPA Guidelines for Preparing Economic Analyses, 2000, pages 52–54). The discounted 20-year total would be 56,317 gallons using a 7 discount rate.

The effectiveness rates for this rule are expected values, and the effect of the rule on any one release may vary widely from the average expected effect. Dividing the total 20-year reduction in gallons released into the total cost of the rule yields a ''break-even'' cost or damage per gallon figure of $3,409 (using total 20-year costs discounted at 7 or $520,141,136), meaning on average the monetized value of avoided damages from the reduction in gallons released from this rule would need to be about $3,409 per gallon in order for benefits to equal costs.[38] For some incidents, the tank car enhancements may eliminate release of the entire contents of the car. Also, we note that at least some of the substances affected by these upgrades pose a much higher immediate risk to human health compared to crude and ethanol. Reducing the likelihood of release of these materials would enhance public safety.

7. Conclusion

The FAST Act instructs the Secretary to make specific regulatory amendments to the aforementioned tank car design standards and phase-out schedule codified in the HM–251 final rule. Since the publication of the FAST Act on December 4, 2015, the text of the HMR differs with the explicit terms of the statute with respect to phase-out schedules, thermal protection blankets, and top fittings protections. The estimated net present value cost of these tank car upgrades is $520 million over 20 years discounted at 7 percent. The implementation of this final rule ensures that all Class 3 flammable liquids are packaged in tank cars meeting improved specifications, thus reducing the likelihood that a train transporting any volume of flammable liquids will release such liquids should it derail. This final rule also minimizes the consequences of an incident should one occur by diminishing the number of tank cars likely to be punctured and the subsequent release of flammable liquids in a derailment. It is necessary and in the public interest to clarify the requirements by rectifying the differences as soon as possible. PHMSA believes that APA notice and comment is unnecessary as it would provide no benefit to the public. Further, PHMSA has no discretion in interpreting the statute; thus public comment would have no impact on the rulemaking. Finally, with regard to Sections 7304 and 7305, the FAST Act instructs the Secretary to act quickly to codify the FAST Act language. Section 7306 has no regulatory mandate, but both PHMSA and FRA are committed to ensuring that the governing regulations align with the FAST Act requirements.

C. Executive Order 13132

This final rule has been analyzed in accordance with the principles and criteria in Executive Order 13132 (''Federalism''). This final rule does not impose any regulation that has substantial direct effects on States, the relationship between the national government and the States, or the distribution of power and responsibilities among the various levels of government. While the final rule could act to preempt State, local, and Indian tribe requirements by operation of law, PHMSA is not aware of any such requirements that are substantively different than what is required by the final rule. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply.

The Federal Hazardous Materials Transportation Law, 49 U.S.C. 5101–5128, contains express preemption provisions (49 U.S.C. 5125) that preempt inconsistent State, local, and Indian tribe requirements, including requirements on the following subjects:

(1) The designation, description, and classification of hazardous materials;

(2) The packing, repacking, handling, labeling, marking, and placarding of hazardous materials;

(3) The preparation, execution, and use of shipping documents related to hazardous materials and requirements related to the number, contents, and placement of those documents;

(4) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material; or

(5) The design, manufacture, fabrication, marking, maintenance, recondition, repair, or testing of a packaging or container represented, marked, certified, or sold as qualified for use in transporting hazardous material.

This rule addresses items (2) and (5) described above and, accordingly, State, local, and Indian tribe requirements on

[38] If we use the discounted total 20-year reduction in gallons released for this calculation (56,317 gallons using a 7 discount rate), then the rule yields a break-even cost per gallon figure of about $9,236, meaning that the monetized value of avoided damages from the reduction in gallons released from this rule would need to be about $9,236 per gallon in order for benefits to equal costs.

these subjects that do not meet the ''substantively the same'' standard will be preempted.[39]

Federal Hazardous Materials Transportation Law provides at § 5125(b)(2) that, if DOT issues a regulation concerning any of the covered subjects, DOT must determine and publish in the **Federal Register** the effective date of Federal preemption. The effective date may not be earlier than the 90th day following the date of issuance of a final rule and not later than two years after the date of issuance. The effective date of Federal preemption is November 14, 2016. This effective date for preemptive effect should not conflict with the overall effective date for this final rule because the regulation of hazardous materials transport in commerce generally preempts State and local requirements. Historically, the States and localities are aware of this preemptive effect and do not regulate in conflict with Federal requirements in these situations.

D. Executive Order 13175

This final rule has been analyzed in accordance with the principles and criteria in Executive Order 13175 (''Consultation and Coordination with Indian Tribal Governments''). Executive Order 13175 requires agencies to assure meaningful and timely input from Indian tribal government representatives in the development of rules that have tribal implications. Because this final rule does not have tribal implications, the funding and consultation requirements of Executive Order 13175 do not apply.

PHMSA is committed to tribal outreach and engaging tribal governments in dialogue. Among other outreach efforts, PHMSA representatives attended the National Joint Tribal Emergency Management Conference on August 11–14, 2015. In the spirit of Executive Order 13175 and consistent with DOT Order 5301.1, PHMSA will be continuing outreach to tribal officials independent of our assessment of the direct tribal implications.

[39] Federal preemption also may exist pursuant to § 20106 of the former Federal Railroad Safety Act of 1970, repealed, revised, reenacted, and codified at 49 U.S.C. 20106, which provides that States may not adopt or continue in effect any law, regulation, or order related to railroad safety or security that covers the subject matter of a regulation prescribed or order issued by the Secretary of Transportation (with respect to railroad safety matters) or the Secretary of Homeland Security (with respect to railroad security matters), except when the State law, regulation, or order qualifies under the section's ''essentially local safety or security hazard.''

E. Regulatory Flexibility Act, Executive Order 13272, and DOT Procedures and Policies

Section 603 of the Regulatory Flexibility Act (RFA) requires an agency to prepare an initial regulatory flexibility analysis describing impacts on small entities whenever an agency is required by 5 U.S.C. 553 to publish a general notice of proposed rulemaking for any proposed rule. Similarly, Section 604 of the RFA requires an agency to prepare a final regulatory flexibility analysis when an agency issues a final rule under 5 U.S.C. 553 after being required to publish a general notice of proposed rulemaking. Because the actions taken in this final rule address congressional mandates that instruct the Secretary to issue conforming regulatory amendments immediately or soon after the FAST Act's date of enactment, PHMSA finds that due and timely execution of agency functions would be impeded by the procedures of public notice that are normally required by the APA. Therefore, PHMSA finds that public notice and comment would be contrary to the public interest and that good cause exists to amend the regulations without such procedures. As prior notice and comment under 5 U.S.C. 553 are not required to be provided in this situation, the analyses in 5 U.S.C. 603 and 604 are also not required.

F. Unfunded Mandates Reform Act of 1995

This rule does not impose unfunded mandates under the Unfunded Mandates Reform Act of 1995. It does not result in costs of $155 million or more, adjusted for inflation, to either State, local, or tribal governments, in the aggregate, or to the private sector in any one year.

G. Paperwork Reduction Act

There are no new information collection requirements in this final rule.

H. Regulation Identifier Number (RIN)

A regulation identifier number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN number contained in the heading of this document may be used to cross-reference this action with the Unified Agenda.

I. Environmental Assessment

The National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321–4347), requires Federal agencies to consider the environmental impacts of proposed actions in their decisionmaking. On May 8, 2015, PHMSA published a final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) as part of the HM–251 final rule (*see* Section X, Part G). This EA described the following: (1) The need for the action, (2) the alternatives considered, (3) the environmental impacts of the alternatives and selected action, and (4) the agencies consulted. Given that the revisions adopted in the FAST Act on December 4, 2015 are an expansion of the existing requirements, PHMSA is incorporating that EA by reference consistent with 40 CFR 1502.21, and updating the alternatives and impacts to discuss the FAST Act changes.

1. Need for the Action

As described in detail above, the FAST Act includes the ''Hazardous Materials Transportation Safety Improvement Act of 2015'' at Sections 7001 through 7311, which instructed the Secretary to make specific regulatory amendments to existing Federal regulations related to tank car design standards and the DOT–111 phase-out schedule codified in the HM–251 final rule. The mandated amendments are non-discretionary, and this action is a response to those mandates.

The need for the requirements in this rulemaking is consistent with that in the HM–251 final rule EA. Specifically, both the HM–251 final rule and this final rule are designed to lessen the consequences of train accidents involving the unintentional release of flammable liquids. The purpose of the regulations for enhanced tank car standards and operational controls is to prevent releases by keeping flammable liquids, including crude oil and ethanol, in rail tank cars and to mitigate the severity of incidents should they occur.

2. Alternatives Considered

As described in section I.A–D above, PHMSA is updating its EA to include discussion of FAST Act mandated changes as described in section I.A through I.D above.

3. Environmental Impacts of Action

As described in the HM–251 final rule EA, the phasing-out of DOT–111 tank cars in flammable liquid service will reduce risk of release because of the improved integrity and safety features of the DOT–117. The changes in the FAST Act will increase the number of tank cars needing to be retrofitted (HHFT vs. flammable liquid tank cars), require thermal protection blanketing on certain

tank cars, and require top fittings and pressure release protections. The increased number of tank cars needing to be retrofitted will further reduce risk of release because the improved integrity and safety features of the DOT–117R will be applied to a wider universe.

In determining our cost calculations in the HM–251 RIA, PHMSA assumed that in order to meet the performance standard specified in § 179.18, each tank car built to meet the DOT–117 and each non-jacketed tank car retrofitted to meet the DOT–117R would do so using a thermal protection blanket.[40] Based on this assumption, only the tank cars transporting flammable liquids that were outside the scope of the HHFT definition, which are now subject to the requirements of the FAST Act, will be impacted by this change. Lastly, all new construction and retrofitted tank cars will now benefit from top fittings and pressure relief valve protection. These additional cars will realize the benefits of improved integrity and safety features. With the addition of more tank cars to be retrofitted and with enhanced safety features, this action will further reduce risk of release, and thereby reduce the potential for adverse environmental effects, beyond the HM–251 final rule because of the improved integrity and safety features of the DOT–117.

It should be noted that the FAST Act provisions will result in the manufacturing of some new tank cars to replace retirements. The FAST Act will also increase the number of tank cars subject to this retrofit requirement. Increased manufacture of replacement rail tank cars and the retrofitting of an increased amount of tank cars could nevertheless result in greater short-term release of greenhouse gases and use of resources needed to make the new tank cars or retrofit existing tank cars.[41] PHMSA, however, concluded that the possibility of increased (yet temporary) greenhouse gases and resource use is far outweighed by the benefits of increased safety and integrity of each railcar and each train, as well as the decreased risk of release of crude oil and ethanol to the environment.

PHMSA also recognizes that increased weight of a larger population of affected tank cars due to the requirements in the FAST Act may result in somewhat greater use of fuel and in turn greater release of air pollutants, including carbon dioxide.[42] However, PHMSA notes that the improved integrity of the tank cars being designed to reduce the risk of release of flammable liquids to the environment positively outweighs a relatively small increase in air pollution due to fuel emissions.

4. Agencies Consulted

PHMSA published the HM–251 final rule in consultation with FRA.

5. Conclusion Finding of No Significant Impact

Given that the revisions adopted by the FAST Act on December 4, 2015 are an expansion of the existing requirements, PHMSA specifically focuses on the impacts these changes will have related to the baseline safety level set by the HM–251 final rule. In the HM–251 final rule EA, PHMSA concluded:

> The provisions of this rule build on current regulatory requirements to enhance the transportation safety and security of shipments of hazardous materials transported by rail, thereby reducing the risks of release of crude oil and ethanol and consequent environmental damage. PHMSA has calculated that this rulemaking will decrease current risk of release of crude oil and ethanol to the environment. Therefore, PHMSA finds that there are no significant environmental impacts associated with this final rule.[43]

PHMSA finds that this same conclusion applies to this action and that there are no significant environmental impacts associated with this final rule.

J. Privacy Act

Anyone may search the electronic form of any written communications and comments received into any of our dockets by the name of the individual submitting the document (or signing the document, if submitted on behalf of an association, business, labor union, etc.). DOT posts these comments, without edit, including any personal information the commenter provides, to *www.regulations.gov,* as described in the system of records notice (DOT/ALL–14 FDMS), which can be reviewed at *www.dot.gov/privacy.*

K. Executive Order 13609 and International Trade Analysis

Under Executive Order 13609 (''Promoting International Regulatory Cooperation''), agencies must consider whether the impacts associated with significant variations between domestic and international regulatory approaches are unnecessary or may impair the ability of American businesses to export and compete internationally. In meeting shared challenges involving health, safety, labor, security, environmental, and other issues, regulatory approaches developed through international cooperation can provide equivalent protection to standards developed independently while also minimizing unnecessary differences.

Similarly, the Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. For purposes of these requirements, Federal agencies may participate in the establishment of international standards, so long as the standards have a legitimate domestic objective, such as providing for safety, and do not operate to exclude imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

PHMSA participates in the establishment of international standards to protect the safety of the American public, and we have assessed the effects of the proposed rule to ensure that it does not cause unnecessary obstacles to foreign trade. Accordingly, this rulemaking is consistent with Executive Order 13609 and PHMSA's obligations under the Trade Agreement Act, as amended. In addition, the FAST Act revises the U.S. retrofit schedule to further align with tank car requirements that Transport Canada has already implemented. This final rule would amend the HMR to further align with Transport Canada's corresponding Transportation of Dangerous Goods Regulations. (See 49 U.S.C. 5120(b).)

L. Executive Order 13211

Executive Order 13211 requires Federal agencies to prepare a Statement of Energy Effects for any ''significant energy action'' [66 FR 28355; May 22, 2001]. Under the Executive Order, a ''significant energy action'' is defined as any action by an agency (normally published in the **Federal Register**) that promulgates, or is expected to lead to

[40] *See* HM–251 Final Rule RIA, p. 172–173.

[41] Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials. Thus increased tank car manufacturing and replacement could result in increased greenhouse gases. See *https://www3.epa.gov/climatechange/ghgemissions/sources/industry.html.*

[42] Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. See *https://www3.epa.gov/climatechange/ghgemissions/sources/transportation.html.*

[43] *See* HM–251 Final Rule, 80 FR at 26743.

the promulgation of, a final rule or regulation (including a notice of inquiry, advance NPRM, and NPRM) that: (1)(i) Is a significant regulatory action under Executive Order 12866 or any successor order and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action.

Although this is a significant regulatory action under Executive Order 12866, PHMSA has evaluated this action in accordance with Executive Order 13211 and has determined this action will not have a significant adverse effect on the supply, distribution, or use of energy. Consequently, PHMSA has determined this regulatory action is not a ''significant energy action'' within the meaning of Executive Order 13211.

List of Subjects

49 CFR Part 173

Hazardous materials transportation, Packaging and containers, Radioactive materials, Reporting and recordkeeping requirements, Uranium.

49 CFR Part 179

Hazardous materials transportation, Incorporation by reference, Railroad safety, Reporting and recordkeeping requirements.

In consideration of the foregoing, we amend 49 CFR chapter I as follows:

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

■ 1. The authority citation for part 173 continues to read as follows:

Authority: 49 U.S.C. 5101–5128, 44701; 49 CFR 1.81, 1.96 and 1.97.

■ 2. In § 173.241, revise paragraph (a) introductory text and paragraph (a)(1) to read as follows:

§ 173.241 Bulk packagings for certain low hazard liquid and solid materials.

* * * * *

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, 117, or 120 tank car tanks; Class 106 or 110 multi-unit tank car tanks; and AAR Class 203W, 206W, and 211W tank car tanks. Additional operational requirements apply to high-hazard flammable trains (*see* § 171.8 of this subchapter) as prescribed in § 174.310 of this subchapter. Except as otherwise provided in this section, DOT Specification 111 tank cars and DOT Specification 111 tank cars built to the CPC–1232 industry standard are no longer authorized to transport Class 3 (flammable) liquids in Packing Group III, unless retrofitted to the DOT Specification 117R retrofit standards or the DOT Specification 117P performance standards provided in part 179, subpart D of this subchapter.

(1) DOT Specification 111 tank cars and DOT Specification 111 tank cars built to the CPC–1232 industry standard are no longer authorized to transport Class 3 (flammable liquids) unless retrofitted prior to the date in the following table:

Material	Jacketed or non-jacketed tank car	DOT–111 not authorized on or after	DOT–111 built to the CPC–1232 not authorized on or after
Class 3, PG III (flammable liquid) material	Non-jacketed	May 1, 2029	May 1, 2029.
	Jacketed	May 1, 2029	May 1, 2029.

Note: For unrefined petroleum products (§ 173.41) and ethanol, *see* §§ 173.242 and 173.243 as appropriate.

* * * * *

■ 3. In § 173.242, revise paragraph (a) introductory text and paragraph (a)(1) to read as follows:

§ 173.242 Bulk packagings for certain medium hazard liquids and solids, including solids with dual hazards.

* * * * *

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, 117, or 120 tank car tanks; Class 106 or 110 multi-unit tank car tanks and AAR Class 206W tank car tanks. Additional operational requirements apply to high-hazard flammable trains (*see* § 171.8 of this subchapter) as prescribed in § 174.310 of this subchapter. Except as otherwise provided in this section, DOT Specification 111 tank cars and DOT Specification 111 tank cars built to the CPC–1232 industry standard are no longer authorized to transport unrefined petroleum products, ethanol, and other Class 3 (flammable) liquids in Packing Group II or III, unless retrofitted to the DOT Specification 117R retrofit standards, or the DOT Specification 117P performance standards provided in part 179, subpart D of this subchapter.

(1) DOT Specification 111 tank cars and DOT Specification 111 tank cars built to the CPC–1232 industry standard are no longer authorized for transport of Class 3 flammable liquids unless retrofitted prior to the dates corresponding to the specific material in the following table:

Material	Jacketed or non-jacketed tank car	DOT–111 not authorized on or after	DOT–111 built to the CPC–1232 not authorized on or after
Unrefined petroleum product	Non-jacketed	January 1, 2018	April 1, 2020.
	Jacketed	March 1, 2018	May 1, 2025.
Ethanol	Non-jacketed	May 1, 2023	July 1, 2023.
	Jacketed	May 1, 2023	May 1, 2025.
Class 3, PG II or III (flammable liquid) material other than unrefined petroleum products and ethanol.	Non-jacketed	May 1, 2029	May 1, 2029.
	Jacketed	May 1, 2029	May 1, 2029.

* * * * *

■ 4. In § 173.243, revise paragraph (a) introductory text and paragraph (a)(1) to read as follows:

§ 173.243 Bulk packaging for certain high hazard liquids and dual-hazard materials which pose a moderate hazard.

* * * * *

(a) *Rail cars:* Class DOT 103, 104, 105, 109, 111, 112, 114, 115, 117, or 120 fusion-welded tank car tanks; and Class 106 or 110 multi-unit tank car tanks. Additional operational requirements apply to high-hazard flammable trains (*see* § 171.8 of this subchapter) as prescribed in § 174.310 of this subchapter. Except as otherwise provided in this section, DOT Specification 111 tank cars and DOT Specification 111 tank cars built to the CPC–1232 industry standard are no longer authorized to transport Class 3 (flammable liquids) in Packing Group I, unless retrofitted to the DOT Specification 117R retrofit standards or the DOT Specification 117P performance standards provided in part 179, subpart D of this subchapter.

(1) DOT Specification 111 tank cars and DOT Specification 111 tank cars built to the CPC–1232 industry standard are no longer authorized for transport of Class 3 (flammable liquids) unless retrofitted prior to the dates corresponding to the specific material in the following table:

Material	Jacketed or non-jacketed tank car	DOT–111 not authorized on or after	DOT–111 built to the CPC–1232 not authorized on or after
Unrefined petroleum products	Non-jacketed	January 1, 2018	April 1, 2020.
	Jacketed	March 1, 2018	May 1, 2025.
Class 3, PG I (flammable liquid) other than unrefined petroleum products.	Non-jacketed	May 1, 2025	May 1, 2025.
	Jacketed	May 1, 2025	May 1, 2025.

* * * * *

PART 179—SPECIFICATIONS FOR TANK CARS

■ 5. The authority citation for part 179 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 49 CFR 1.81 and 1.97.

■ 6. Revise § 179.202–6 to read as follows:

§ 179.202–6 Thermal protection system.

The DOT Specification 117 tank car must have a thermal protection system. The thermal protection system must:

(a) Conform to § 179.18 of this part;

(b) Be equipped with a thermal protection blanket with at least ½-inch-thick material that meets § 179.18(c) of this part; and

(c) Include a reclosing pressure relief device in accordance with § 173.31 of this subchapter.

■ 7. In § 179.202–12, revise the section heading to read:

§ 179.202–12 Performance standard requirements (DOT–117P).

* * * * *

■ 8. In § 179.202–13, revise paragraphs (e) and (h) to read as follows:

§ 179.202–13 Retrofit standard requirements (DOT–117R).

* * * * *

(e) *Thermal protection system.* (1) The DOT Specification 117R tank car must have a thermal protection system. The thermal protection system must conform to § 179.18 of this part and include a reclosing pressure relief device in accordance with § 173.31 of this subchapter.

(2) A non-jacketed tank car modified to the DOT Specification 117R must be equipped with a thermal protection blanket with at least ½-inch-thick material that meets § 179.18(c) of this part.

* * * * *

(h) *Top fittings protection*—(1) *Protective housing.* Except as provided in §§ 179.202–13(h)(2) and (3) of this paragraph, top fittings on DOT Specification 117R tank cars must be located inside a protective housing not less than 12-inch in thickness and constructed of a material having a tensile strength not less than 65 kpsi and must conform to all of the following conditions:

(i) The protective housing must have a height exceeding the tallest valve or fitting which requires protection and the height of a valve or fitting within the protective housing must be kept to the minimum size compatible to allow for proper operation.

(ii) The protective housing or cover may not reduce the flow capacity of a pressure relief device below the minimum required.

(iii) The protective housing must provide a means of drainage with a minimum flow area equivalent to six (6) 1-inch diameter weep holes.

(iv) When connected to the nozzle or fitting cover plate, and subject to a horizontal force applied perpendicular to and uniformly over the projected plane of the protective housing, the tensile connection strength of the protective housing must be designed to be—

(A) no greater than 70 percent of the nozzle to tank tensile connection strength;

(B) no greater than 70 percent of the cover plate to nozzle connection strength; and

(C) no less than either 40 percent of the nozzle to tank tensile connection strength or the shear strength of twenty (20) 12-inch bolts.

(2) *Pressure relief devices.* (i) The pressure relief device(s) must be located inside the protective housing, unless space does not allow for placement within a housing. If multiple pressure relief devices are installed, no more than one (1) may be located outside of a protective housing.

(ii) The height of a pressure relief device located outside of a protective housing in accordance with paragraph (h)(2)(i) of this section may not exceed the tank car jacket by more than 12 inches.

(iii) The highest point of a closure of any unused pressure relief device nozzle may not exceed the tank car jacket by more than six (6) inches.

(3) *Alternative.* As an alternative to the protective housing requirements in paragraph (h)(1) of this section, the tank car may be equipped with a system that prevents the release of contents from any top fitting under accident conditions where any top fitting may be sheared off.

Issued in Washington, DC, on August 10, 2016, under authority delegated in 49 CFR part 1.97.

Marie Therese Dominguez,

Administrator, Pipeline and Hazardous Materials Safety Administration.

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