



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

MAY 09 2019

Kenneth B. Dorsey
Association of American Railroads
425 Third Street, SW
Washington, DC 20024

Reference No. 18-0036R

Dear Mr. Dorsey:

The Pipeline and Hazardous Materials Safety Administration is clarifying this previously issued letter of interpretation based on further review. In your March 13, 2018, letter, you had requested clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to specifications for DOT-111 and DOT-117 series tank cars. While PHMSA's original response is accurate, it did not fully address all of your concerns. Specifically, we are expanding on our answer to Question 2 to more comprehensively address DOT-111 tank cars retrofitted to a DOT-117R specification.

We have paraphrased and answered your questions as follows:

- Q1. You ask whether a DOT-111 tank car manufactured after October 1, 2015, is eligible to be retrofitted to DOT-117R or DOT-117P specification.
- A1. The answer is no. In accordance with § 174.310(a)(4), if used to transport flammable liquids, only DOT-111 tank cars manufactured before October 1, 2015 are eligible to be retrofit to the DOT-117R specification.
- Q2. Certain jacketed DOT-111 tank cars are equipped with fiberglass insulation, which is not an approved thermal protection system, in accordance with § 179.18(c). You ask whether these tank cars being retrofitted to the DOT-117 specification require documentation of a thermal analysis to show that they are capable of achieving the performance standard in § 179.18(a).
- A2. When converting jacketed DOT-111 tank cars equipped with a thermal protection system not on the list of systems that do not require verification (see § 179.18(c)), each tank car owner must ensure a thermal analysis has been conducted, verified and documented (see § 179.18(b)) that demonstrates that the thermal protection system for the tank car(s) being converted meets the performance standard in § 179.18(a). Procedures for completing the thermal analysis are outlined in Part 179, Appendix B. To meet the requirements for the DOT-117P specification tank car, the design must receive additional approval from Associate Administrator for Railroad Safety/Chief Safety Officer, Federal Railroad Administration (FRA). Jacketed DOT-111 tank cars that are retrofitted to the DOT-117R specification do not require additional approval from the FRA, provided the requirements in § 179.18(a) and (b) are met.

- Q3. You ask if the minimum plate thickness requirements for DOT-117R specification can be based on the minimum plate thickness requirement at the time of original construction.
- A3. The answer is yes. In accordance with § 179.202-13(c), the minimum plate thickness for all tank cars manufactured to the DOT-117R is 7/16 of an inch. However, DOT-111 tank cars manufactured to the Association of American Railroads CPC-1232 standard have a minimum plate thickness of 1/2 an inch. Additionally, when calculating minimum allowable tank shell thickness in accordance with § 180.509(f), the original plate thickness at time of construction must be used for these calculations.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,



Dirk Der Kinderen
Chief, Standards Development Branch
Standards and Rulemaking Division

Ciccarone
18-0130

January, Ikeya CTR (PHMSA)

From: Kelley, Shane (PHMSA)
Sent: Monday, October 15, 2018 11:31 AM
To: January, Ikeya CTR (PHMSA); Dodd, Alice (PHMSA)
Cc: DerKinderen, Dirk (PHMSA); Foster, Glenn (PHMSA); Ciccarone, Michael (PHMSA); Bridson, Andrew (PHMSA)
Subject: FW: Tank Car Issue - Fiberglass Insulation Tank Cars
Attachments: JacketedTPRequest Final-22feb16.pdf; RSI-CTC Letter to FRA and PHMSA re DOT117R Thermal Protection System Req....pdf; Letter to K. Eichenlaub FRA from RSI re DOT117R Thermal Protection System....pdf; FRA Response Letter to RSI re Fiberglass Insulation (11.23.16).pdf; 2018-3-14 Request for Interpretations 3.pdf; PHMSA Response to Ken Dorsey on Approval of CPC-1232 Fiberglass Insulate....pdf

Please process this as a request for clarification that would be issued as a revision to 18-0036.

Mr. Ciccarone will handle coordination as per our standard SOPs.

I'd like this to go through the additional coordination that requires executive review so please include me on the coordination chain.

Thanks all

From: Kimball, Emily E. [mailto:emily.kimball@hoganlovells.com]
Sent: Thursday, October 11, 2018 3:50 PM
To: Svee, Alayne CTR (PHMSA) <alayne.svee.ctr@dot.gov>; Gordon, Stephen (PHMSA) <stephen.n.gordon@dot.gov>; Horsley, Adam (PHMSA) <adam.horsley@dot.gov>; Kelley, Shane (PHMSA) <shane.kelley@dot.gov>; Qureshi, Mona (PHMSA) <mona.qureshi@dot.gov>; Majors, Leonard (PHMSA) <leonard.majors@dot.gov>; Hamit, Safiya (PHMSA) <safiya.hamit@dot.gov>
Cc: Montague, R. Latane <latane.montague@hoganlovells.com>
Subject: RE: Tank Car Issue - Fiberglass Insulation Tank Cars

Dear All,

Thank you again for making time for yesterday's call regarding conversion of legacy DOT-111 tank cars equipped with a thermal protection system consisting of a jacket, fiberglass insulation, and pressure relief valve (i.e., "fiberglass insulation tank cars" referenced hereafter as the "jacket/insulation configuration") to DOT-117Rs. I appreciate the opportunity discuss the Railway Supply Institute's ("RSI") concerns and clarify exactly what information RSI is seeking at this time.

In light of FRA and PHMSA's 2016 determination letter (attached and discussed below), RSI understands that existing tank cars equipped with a jacket/insulation configuration meet the 49 C.F.R. § 179.18(a) thermal protection system performance standard, thus satisfying the thermal protection system requirement for DOT-117Rs, as set forth in § 179.202-13(e). Therefore, these tank cars are eligible for conversion to DOT-117R, provided they meet the remaining DOT-117R specifications set forth in § 179.202-13. The 2016 determination letter was also clear that the 2016 AFFTAC study, examining the thermal performance of these jacket/insulation configuration tank cars using ethanol and five types of crude oil, was sufficient to demonstrate the performance standard by use of the thermal analysis in accordance with § 179.18(b).

RSI members are only seeking conversion to DOT-117Rs at this time, and are not seeking approval of these cars for conversion to DOT-117P. Therefore, the question at this time, is what specific documentation is needed to accompany an application for conversion of a DOT-111 car equipped with the jacket/insulation configuration to a DOT-117R, for purposes of demonstrating compliance with 49 C.F.R. § 179.18. RSI understands that the 2016 AFFTAC study is sufficient, consistent with PHMSA and FRA's 2016 determination.

I have provided more detail and context on this issue below. If you need any further clarification or have specific questions as you review this information and consider the DOT-117R conversion question please call me at 303.454.2549.

2016 Determination

As we discussed on yesterday's call, in February 2016, the RSI-CTC sent a letter to FRA (attached) requesting approval to "utilize jacketed, fiberglass insulation thermal protection systems on existing jacketed legacy and CPC-1232 tank cars presently in flammable liquids service in order to satisfy the DOT-117R specification." Together with the letter, the RSI-CTC provided FRA with a copy of an AFFTAC study demonstrating that tank cars equipped with this jacket/insulation configuration are compliant with the thermal protection system performance standard set forth in 49 C.F.R. § 179.18(a), such that this system is capable of providing "sufficient thermal resistance" with no release of lading, except through a pressure release device, when subjected to a 100-minute pool fire and a 30-minute torch fire. FRA responded to the RSI-CTC's letter on November 23, 2016 (attached), stating:

FRA and [PHMSA] have determined that approval to use [existing tank cars with the jacket/insulation configuration] in flammable liquid service is not required, but the requirements of Title 49 Code of Federal Regulations Section 179.18, *Thermal protection systems*, must be met. Specifically, the tank cars must meet either a performance standard as verified by a thermal analysis (see § 179.18(b)) or be equipped with a thermal protection system that no longer requires verification (see § 179.18(c)). **After reviewing the information submitted, which included the results of thermal analysis, FRA and PHMSA have determined that the tank car thermal protection system in question [i.e., the jacket/insulation configuration] has been analyzed in accordance with § 179.18(b), and therefore may be used in flammable liquid service as a DOT-117R provided that each car satisfies all the specification requirement for DOT-117R set forth in § 179.202-13.**

Accordingly, since November 23, 2016, RSI-CTC has understood that both FRA and PHMSA agree that the jacket/insulation configuration satisfies the thermal protection system standard in § 179.18 and that tank cars equipped with this configuration may be offered in service as DOT-117Rs, provided they meet all other specification requirements for DOT-117Rs, as set forth in § 179.202-13.

This is consistent with the mandates of the FAST Act and with PHMSA's regulations regarding DOT-117R requirements, as modified to conform to the FAST Act requirements. PHMSA's revisions to the DOT-117R standard made clear that the application of a thermal protection blanket is required for non-jacketed tank cars that are modified to meet the DOT-117R standard but that this requirement does not extend to jacketed tank cars. Rather, jacketed DOT-111s and jacketed CPC1232s that are modified to meet the DOT-117R standard simply must have a thermal protection system that meets the performance standard specified in 49 C.F.R. § 179.18. We are not aware of any provision in either the FAST Act or PHMSA's regulations that would require tank cars equipped with the jacket/insulation configuration be converted to DOT-117Ps rather than DOT-117Rs.

As such, § 179.202-13(e), the thermal protection requirement for DOT-117Rs, states:

(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.

For a more detailed legal analysis of the statutory and regulatory history supporting this conclusion, please see the RSI-CTC's Letter to Kurt Eichenlaub, FRA dated October 27, 2016 (attached). To the extent PHMSA or FRA are concerned about subsequent ability to identify which DOT-117Rs have the jacket/insulation configuration versus a thermal protection blanket, this information would be readily ascertainable through UMLER.

RSI's confusion arises out of PHMSA's letter dated September 18, 2018 to Kenneth Dorsey at the Association of American Railroads ("AAR") (hereafter, PHMSA 2018 Response Letter) responding to AAR's March 13, 2018, letter requesting clarification of the Hazardous Materials Regulations ("HMR") applicable to specification for DOT-111 and DOT-117 series tank cars. AAR's letter sought "guidance regarding documentation to approve as DOT-117R tank cars built as jacketed DOT-111 cars and equipped with only fiberglass insulation [i.e., the jacket/insulation configuration]." However, answer "A2" of the PHMSA 2018 Response Letter states a thermal analysis is required to demonstrate eligibility for conversion to a DOT-117P specification tank car, in accordance with 49 C.F.R. § 179.202-12(a). The response does not answer the specific documentation question. Moreover, the suggestion that these cars are only eligible for conversion to a DOT-117P conflicts with the prior 2016 determination from PHMSA and FRA that these cars are eligible for conversion to DOT-117R. As stated above, RSI members are only seeking conversion to DOT-117Rs at this time.

Impact on the North American Fleet

There are approximately 19,000 tank cars in the existing tank car fleet with this jacket/insulation configuration. Since the 2016 determination letter, RSI members have submitted several of applications, impacting hundreds of tank cars, for conversion to DOT-117R to the AAR for approval. However, these applications are being held up, pending the resolution of the documentation question. Because of the configuration of the jacketed/insulation tank cars, which are also equipped with heating coils, these tank cars are well suited to move heavier crude oil and will likely be used in Canada. Transport Canada (TC) has already committed that it will approve the use of these tank cars as the TC-equivalent of a DOT-117R using TC's special permit procedures. Therefore, confirming their eligibility for conversion to DOT-117Rs would be consistent with Transport Canada's treatment of these tank cars and would harmonize the U.S. and Canadian requirements to avoid any disruptions to international commerce.

Thank you again for your willingness to provide additional clarity on this topic. Please let me know if there is any further information you need or anything you would like to discuss as you review this information and consider the DOT-117R documentation question.

For your reference, I have attached the following correspondence related to this matter:

- RSI-CTC's Letter to Karl Alexy, FRA (Feb. 22, 2016)
- RSI-CTC's Letter to FRA Administrator Feinberg and PHMSA Administrator Dominguez (July 25, 2016)
- RSI-CTC's Letter to Kurt Eichenlaub, FRA (October 27, 2016)
- Response Letter from Thomas Herrmann, FRA to RSI-CTC (Nov. 23, 2016)
- AAR's Clarification Letter to PHMSA (Mar. 14, 2018)
- PHMSA's Response Letter to Ken Dorsey, AAR (Sept. 18, 2018)

Sincerely,

Emily

Emily Kimball

Senior Associate

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-----Original Appointment-----

From: Svee, Alayne CTR (PHMSA) [<mailto:alayne.svee.ctr@dot.gov>]

Sent: Wednesday, October 10, 2018 12:50 PM

To: Svee, Alayne CTR (PHMSA); Gordon, Stephen (PHMSA); Kimball, Emily E.; Horsley, Adam (PHMSA); Kelley, Shane (PHMSA); Qureshi, Mona (PHMSA); Majors, Leonard (PHMSA)

Subject: Tank Car Issue

When: Wednesday, October 10, 2018 4:00 PM-5:00 PM (UTC-05:00) Eastern Time (US & Canada).

Where: ConfRm-HQ-E26-124 (PHMSA) (near PHC)

Importance: High

Conference Line: (877) 336-1829

Access Code: 2596426

* * * * *

Host Access Code: 8323

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Support, Connection, Advocacy

425 Third Street, SW | Suite 920 | Washington, DC 20024 | phone (202) 347-4664 | fax (202) 347-0047 | www.rsiweb.org

February 22, 2016

Mr. Karl Alexy
Staff Director, Office of Safety Assurance and Compliance
Federal Railroad Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Mr. Alexy,

As you know, HM-251 requires that tank cars retrofitted to the DOT117R specification be equipped with a DOT approved thermal protection system (TPS) that meets the criteria specified in CFR 179.18. This includes the requirement that the TPS facilitate survival of the tank for 100 minutes in an AFFTAC pool fire simulation. Research and analysis performed by the The Railway Supply Institute Committee on Tank Cars (RSI-CTC) indicates these requirements can be satisfied using a TPS consisting of a jacket and fiberglass insulation. Fiberglass insulation, however, is not a DOT approved material in Appendix B of 49CFR 179.18. Therefore, the RSI-CTC is requesting approval from FRA to utilize jacketed, fiberglass insulation thermal protection systems on existing jacketed legacy and CPC -1232 tank cars presently in flammable liquids service in order to satisfy the DOT117R specification.

The RSI-AAR Safety project recently commissioned an AFFTAC study to provide the justification for this request, the results of which were recently presented to FRA and PHMSA. In our analyses, we refer to research performed by FRA which shows fiberglass insulation will meet the Appendix B performance requirements provided there is a means to secure it from falling. We incorporated this finding and other pertinent information into our AFFTAC study. The results show that jacketed fiberglass insulation systems facilitate simulated survival times that range from 130 to 180 minutes for ethanol and the most common crude oil commodities.

To be clear, RSI Committee on Tank Cars is requesting FRA approval to use jacketed fiberglass insulation thermal protection systems only on existing jacketed tank cars that will be retrofitted to the HM-251 requirements. Existing non-jacketed retrofit cars and newly built cars will be equipped with high temperature blankets. Please feel free to contact me if you have any questions or require additional information regarding our request.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Simpson", written in a cursive style.

Thomas D. Simpson
President, Railway Supply Institute, Inc.



Support, Connection, Advocacy

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July 25, 2016

Sarah E. Feinberg
Administrator
Federal Railroad Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
West Building, Room W30-308
Washington, DC 20590

Marie Therese Dominguez
Administrator
Pipeline and Hazardous Material Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
East Building, 2nd Floor, Suite E27
Washington, DC 20590

Re: DOT-117R Thermal Protection System Requirement

Dear Administrator Feinberg and Administrator Dominguez:

I write on behalf of the Railway Supply Institute's ("RSI") Committee on Tank Cars ("RSI-CTC")¹ to raise an issue regarding the thermal protection system requirement for DOT-117R tank cars included in the Pipeline and Hazardous Materials Safety Administration's ("PHMSA") and Federal Railroad Administration's ("FRA") May 8, 2015 final rule entitled "Hazardous Materials: Enhanced Tank Car Standards and Operational Controls for High-Hazard Flammable Trains" (80 FR 26643; "HM-251 Final Rule").

As you know, the HM-251 Final Rule requires that tank cars modified to the DOT-117R specification be equipped with a DOT-approved thermal protection system that meets the criteria specified in 49 C.F.R. § 179.18. This regulation in turn requires that the thermal protection system provide the tank car with "sufficient thermal resistance so that there will be no release of any lading

¹ RSI is the international trade association of the railway supply industry. Its members provide all types of goods and services to freight and passenger railroads, rail shippers and freight car manufacturers and lessors. The members of the RSI-CTC collectively build more than ninety-five percent (95%) of all new railroad tank cars and own and provide for lease over sixty-five percent (65%) of railroad tank cars operating in North America. The RSI-CTC members include: American Railcar Industries; American Railcar Leasing; CIT Rail; GATX Corporation; The Greenbrier Companies; Trinity Rail Group, LLC; and Union Tank Car Company.

within the tank car, except release through a pressure release device, when subjected to: a pool fire for 100 minutes and a torch fire for 30 minutes.”

Over the past 12 months, the RSI-CTC commissioned an AFFTAC study to analyze and verify whether these requirements can be satisfied by a thermal protection system consisting of a jacket, fiberglass insulation, and pressure release valve. We have focused on these components because this is the configuration in a subset of existing jacketed DOT-111 and jacketed CPC-1232 tank cars in the flammable liquids fleet. This subset totals approximately 20,000 tank cars. Although this thermal protection system is not listed in Appendix B of Part 179, our analysis demonstrates that it complies with the performance standard of 49 C.F.R. § 179.18 based on the analysis methodology prescribed in that regulation.

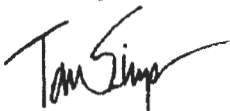
As stated in our prior February 22, 2016 letter to Mr. Karl Alexy in the Office of Safety Assurance and Compliance, our analysis concludes that a thermal protection system consisting of a jacket, fiberglass insulation, and pressure relief device would survive a 100 minute pool fire and a 30 minute torch fire. In fact, the results show that jacketed fiberglass insulation systems facilitate simulated survival times that range from 130 to 180 minutes for ethanol and the most common crude oil commodities. Engineers from the RSI-CTC member companies have participated in numerous meetings and telephone conferences with FRA and PHMSA personnel to answer questions about this study and provide further information to your technical staff.

In light of the AFFTAC study, the RSI-CTC respectfully requests that the FRA and PHMSA allow the continued use of existing tank cars equipped with the jacket/fiberglass insulation thermal protection systems. Otherwise, modification of these existing jacketed tank cars would require stripping the tank car of its jacket, applying a ceramic blanket and completely new jacket, in addition to the other work required to modify the tank car. Particularly for the jacketed CPC-1232s, what would otherwise be an approximate 20 hour modification would become an approximate 500 hour modification and would greatly impact the availability of DOT-117R tank cars to service the flammable liquids fleet.

To be clear, this issue only impacts a subset of the existing jacketed DOT-111 and CPC-1232 tank cars. All newly built DOT-117 tank cars would be equipped with a ceramic fiber blanket thermal protection system. In addition, existing non-jacketed tank cars modified to the DOT-117R standard would also be equipped with a ceramic fiber blanket thermal protection system, as would existing jacketed tank cars already containing a ceramic fiber blanket that will be modified to the DOT-117R standard.

We appreciate your consideration of this matter and look forward to continuing to work with FRA and PHMSA on enhancing the overall safety of the tank car fleet. Please contact me directly if you have any follow-up questions about the foregoing.

Sincerely,



Thomas D. Simpson
President



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October 27, 2016

Mr. Kurt Eichenlaub
Acting Staff Director, Hazardous Materials Division
Federal Railroad Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: DOT-117R Thermal Protection System Requirement

Dear Mr. Eichenlaub:

I write on behalf of the Railway Supply Institute's ("RSI") Committee on Tank Cars ("RSI-CTC")¹ regarding the thermal protection system requirement for DOT-117Rs, codified at 49 C.F.R. § 179.202-13(e). In particular, the RSI has reviewed the applicable provisions of the Fixing America's Surface Transportation Act of 2015 (the "FAST Act")² and its implementing regulations issued by the Federal Railroad Administration ("FRA") and the Pipeline and Hazardous Materials Safety Administration ("PHMSA") to determine whether existing tank cars equipped with a jacket, fiberglass insulation, and pressure release valve (hereafter, the "jacket/insulation configuration") would comply with the thermal protection system specification for DOT-117R tank cars. For the reasons set forth below, we conclude that the jacket/insulation configuration would be compliant because it meets the thermal protection performance standard in 49 C.F.R. § 179.18.

Statutory and Regulatory History

On August 15, 2016, FRA and PHMSA issued a final rule amending the Hazardous Materials Regulations to conform to the mandates of the FAST Act (hereafter, "amended HM-251 rule"),³ including those provisions regarding the thermal protection system requirements for DOT-117Rs. The FAST Act required DOT to "issue such regulations as are necessary to require that each tank car built to meet the DOT-117 specification and each non-jacketed tank car modified to meet the DOT-117R specification be equipped with an insulating blanket with at least ½-inch-thick material

¹ RSI is the international trade association of the railway supply industry. Its members provide all types of goods and services to freight and passenger railroads, rail shippers and freight car manufacturers and lessors. The members of the RSI-CTC collectively build more than ninety-five percent (95%) of all new railroad tank cars and own and provide for lease over sixty-five percent (65%) of railroad tank cars operating in North America. The RSI-CTC members include: American Railcar Industries; American Railcar Leasing; CIT Rail; GATX Corporation; The Greenbrier Companies; Trinity Rail Group, LLC; and Union Tank Car Company.

² Pub. L. 114-94, Sections 7301-7311

³ 81 Fed. Reg. 53935 (Aug. 15, 2016).

that has been approved by the Secretary pursuant to [49 C.F.R. § 179.18(c)].⁴ Congress did not require that existing jacketed tank cars modified to the DOT-117R standard also be equipped with a thermal blanket.

Consistent with this mandate, PHMSA and FRA revised the thermal protection system requirement for tank cars modified to the DOT-117R standard as follows:⁵

(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.

This revision made clear that that the application of a thermal protection blanket is required for non-jacketed tank cars that are modified to meet the DOT-117R standard but that this requirement does not extend to jacketed tank cars. Rather, jacketed DOT-111s and jacketed CPC-1232s that are modified to meet the DOT-117R standard simply must have a thermal protection system that meets the performance standard specified in 49 C.F.R. § 179.18.

Analysis of the DOT-117R Thermal Protection System Requirement

In drafting the original HM-251 rule,⁶ PHMSA assumed that a thermal protection blanket would be the “technology of choice” for satisfying the thermal protection requirement for DOT-117s and DOT-117Rs.⁷ PHMSA further explained that the FAST Act’s requirement that the thermal protection blanket be applied to new DOT-117s and non-jacketed tank cars modified to meet the DOT-117R standard “is consistent with the assumptions it made for meeting the DOT-117R in the [original HM-251 rule] regulatory impact analysis.”⁸ However, with respect to jacketed tank cars, PHMSA acknowledges that “[n]either 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.”⁹ The agency further states that “the thermal protection blanketing provision will only affect those non-jacketed flammable liquid cars in need of retrofit” which it estimates to be “18,546 tank cars (comprised of non-jacketed legacy DOT-111 and non-jacketed CPC-1232 tank cars)” in other flammable liquids service.¹⁰ Although PHMSA noted that it included the cost of “removal and replacement of jackets (for DOT-111 cars) in the retrofit costs” when it published the original HM-251 rule,¹¹ these assumptions are not binding as they were not codified in either the original HM-251 rule or the revised HM-251 rule.

⁴ *Id.* at Section 7305(a).

⁵ 81 Fed. Reg. 53957 (Aug. 15, 2016) (codified at 49 C.F.R. § 179.202-13).

⁶ 80 Fed. Reg. 26644, 26671 (May 8, 2016) (hereafter “original HM-251 rule”).

⁷ 81 Fed. Reg. 53937.

⁸ 81 Fed. Reg. 53943.

⁹ 81 Fed. Reg. 53943.

¹⁰ 81 Fed. Reg. 53943.

¹¹ 81 Fed. Reg. 53937.

PHMSA and FRA have clearly articulated that the application of a thermal protection blanket is required for non-jacketed tank cars that are modified to meet the DOT-117R standard.¹² The amended HM-251 rule does not include the same requirement for jacketed DOT-111s or jacketed CPC-1232s that are modified to meet the DOT-117R standard. Instead, these tank cars must be equipped with a configuration that meets the performance standard specified in 49 C.F.R. § 179.18 in order to meet the DOT-117R standard.

The Jacket/Insulation Configuration Meets the Thermal Protection Performance Standard

The Hazardous Material Regulations do not define the term “thermal protection system,” but instead set forth a thermal protection performance standard in 49 C.F.R. § 179.18. PHMSA requires that tank cars be equipped with a thermal protection system capable of providing the tank car with “sufficient thermal resistance so that there will be no release of any lading within the tank car, except release through a pressure release device, when subjected to: a pool fire for 100 minutes and a torch fire for 30 minutes.”¹³

Existing jacketed tank cars that undergo modification to the DOT-117R standard must conform to 49 C.F.R. § 179.18. This means their thermal protection system must meet the performance standard specified in 49 C.F.R. § 179.18(a) – i.e., the ability to withstand a pool fire for 100 minutes and a torch fire for 30 minutes. Moreover, compliance with the performance standard must be verified by analyzing the fire effects on the entire surface of the tank car, using the analysis methodology set forth in § 179.18(b). PHMSA has acknowledged that § 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” provided the system meets the performance requirement.¹⁴

During the last twelve months, the Railway Supply Institute’s Committee on Tank Cars (“RSI-CTC”) commissioned an AFFTAC study to analyze and verify whether a tank car equipped with the jacket/insulation configuration satisfies the thermal protection system performance standard. This study was carried out consistent with the methodology set forth in 49 C.F.R. § 179.18(b), as required. More specifically, the fire effects on existing DOT-111 and CPC-1232 jacket/insulation configuration tank cars were analyzed using procedures consistent with those provided in the DOT publication DOT/FRA/OR&D-84/08.11 (1984), using the AFFTAC fire simulation model in accordance with the requirements of § 179.18(b).

We focused on the jacket/insulation configuration because this is the configuration in a subset of existing jacketed DOT-111 and jacketed CPC-1232 tank cars in the flammable liquids fleet which total approximately 20,000 tank cars. The AFFTAC study concluded that this thermal protection system would permit a tank car to survive a 100 minute pool fire and a 30 minute torch fire, as required by the regulations, even though it does not have a thermal protection blanket. In fact, the results show that tank cars equipped with the jacket/insulation configuration facilitate simulated survival times that range from 130 to 180 minutes for ethanol and the most common crude oil commodities. These results were provided to Mr. Karl Alexy in the Office of Safety Assurance

¹² 81 Fed. Reg. 53935 (“each non-jacketed tank car retrofitted to meet the DOT Specification 117R to be equipped with a thermal protection blanket”); *Id.* at 53938 (“a thermal protection blanket meeting § 179.18(c) is now a requirement...for the DOT-117R if the tank car undergoing retrofit is non-jacketed”); *Id.* at 53941 (“Section 7305 of the FAST Act mandates that...each non-jacketed tank car retrofitted to meet the DOT-117R be equipped with a thermal protection blanket”);

¹³ 49 C.F.R. § 179.18(a).

¹⁴ 81 Fed. Reg. 53937.

and Compliance and engineers from the RSI-CTC member companies have participated in numerous meetings and telephone conferences with FRA and PHMSA personnel to answer questions about this study and provide further information to technical staff.

Conclusion

Existing jacketed tank cars must be equipped with a configuration that meets the thermal protection performance standard set forth in 49 C.F.R. § 179.18(a) in order to meet the DOT-117R thermal protection system specification codified at 49 C.F.R. § 179.202-13(e). The AFFTAC test results described above indicate that existing tank cars equipped with the jacket/insulation configuration meet the thermal protection performance standard. Therefore, the RSI-CTC has determined that existing tank cars equipped with the jacket/insulation configuration would comply with the DOT-117R thermal protection system requirement and may continue in use provided they meet the rest of the DOT-117R specifications by the applicable modification deadlines.

We appreciate your confirmation of the RSI-CTC's understanding of these requirements and look forward to continuing to work with FRA and PHMSA on enhancing the overall safety of the tank car fleet. Please contact me directly if you have any follow-up questions about the foregoing.

Sincerely,

A handwritten signature in black ink that reads "Tom Simpson". The signature is written in a cursive, flowing style.

Thomas D. Simpson
President



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

NOV 23 2016

Mr. Thomas D. Simpson
President
Railway Supply Institute
425 Third Street SW, Suite 920
Washington, DC 20024

Dear Mr. Simpson:

Thank you for your February 22, 2016, letter requesting the Federal Railroad Administration's (FRA) approval to continue using jacketed legacy and CPC-1232 tank cars in flammable liquid service. Your letter also indicated that the RSI Committee on Tank Cars is requesting FRA approval to use fiberglass insulation as thermal protection systems only on existing jacketed tank cars that will be retrofitted to the HM-251 requirements for DOT Specification 117R (DOT-117R).

FRA and the Pipeline and Hazardous Materials Safety Administration (PHMSA) have determined that approval to use these tank cars in flammable liquid service is not required, but the requirements of Title 49 Code of Federal Regulations Section 179.18, *Thermal protection systems*, must be met. Specifically, the tank cars must meet either a performance standard as verified by a thermal analysis (see § 179.18(b)) or be equipped with a thermal protection system that no longer requires verification (see § 179.18(c)). After reviewing the information submitted, which included the results of thermal analyses, FRA and PHMSA have determined that the tank car thermal protection system in question has been analyzed in accordance with § 179.18(b), and therefore may be used in flammable liquid service as a DOT-117R provided that each car satisfies all the specification requirements for DOT-117R set forth in §179.202-13.

If you have any questions, the point of contact is Mr. Kurt Eichenlaub, Acting Staff Director, Hazardous Materials Division. Mr. Eichenlaub can be reached at (202) 493-6050 or KurtEichenlaub@dot.gov.

Sincerely,

Thomas J. Herrmann
Director, Office of Technical Oversight



ASSOCIATION OF
AMERICAN RAILROADS

Safety and Operations

Kenneth B. Dorsey
Executive Director Tank Car Safety

Mr. Shane R. Kelley
Director, Office of Standards and Rulemaking
Office of Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration
United States Department of Transportation
1200 New Jersey Avenue SE
East Building, PHH-10
Washington, DC 20590-0001

Subject: Request for Interpretation

Dear Mr. Kelley:

AAR is seeking clarification of three issues related to the 49 CFR Part 179, Subpart D specifications for DOT-111 and DOT-117 tank cars. We respectfully request that you expedite your response to the extent practicable.

The first question relates to time limitations for conversions of DOT-111 tank cars into DOT-117R tank cars. AAR has received approval requests for conversion of DOT-111 tank cars constructed after October 1, 2015 to DOT-117R cars. It seems apparent that such requests circumvent DOT's regulatory intent in establishing a new, safer standard. Title 49 CFR 174.310(a)(4) provides that:

“[a]fter October 1, 2015, tank cars manufactured for use in a HHFT must meet: (i) DOT Specification 117, or 117P performance standard in part 179, subpart D of this subchapter; or (ii) An authorized tank specification as specified in part 173, subpart F of this subchapter.

To allow manufacturers to build new DOT-111 cars and convert them to DOT-117Rs would provide a disincentive to the adoption and manufacture of the DOT-117 standard cars, which provide superior safety benefits.

- 1. AAR requests an interpretation on whether DOT-111 cars built after October 1, 2015, are ineligible to be retrofitted to DOT-117R or P class. We expect that the answer is yes, which would also provide regulatory consistency with Canadian standards.²**

¹ See TP-14877 2015, 8.3.25.2eii (available at <https://www.tc.gc.ca/eng/tdg/publications-tp14877-1164.html#8-3-general-requirements>)

Next, AAR is also seeking guidance regarding documentation to approve as DOT-117R tank cars built as jacketed DOT-111 cars and equipped with only fiberglass insulation. Under 49 CFR 179.4(a), AAR's Executive Director of Tank Car Safety is charged with granting approval for the alteration of DOT specification tank cars. The thermal protection requirements for DOT-117R are set forth in 49 CFR 179.202-13(e), which requires that tank cars employ a thermal protection system that complies with 49 CFR § 179.18. The 179.18 section establishes a requirement that thermal protection systems not included on a list referenced in 179.18(c) must provide documentation of a thermal analysis to show that they are capable of achieving a performance standard. In the case of DOT-117R conversions for jacketed cars equipped with fiberglass insulation, they met the standards when they were built to the DOT-111 specification, but the thermal protection system is not on the 49 CFR 179.18(c) approved list.

Additionally, Transport Canada (TC) guidance for previously jacketed DOT-111 class cars equipped with only fiberglass insulation indicates that only cars meeting the requirements of CPC-1232 will be considered for a temporary certificate. AAR requests that DOT harmonize the domestic requirements with those of TC in-order to avoid disrupting international commerce.

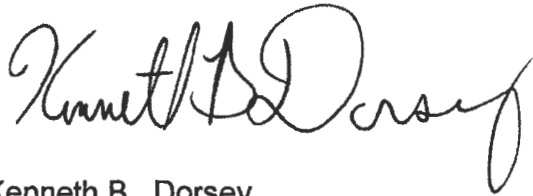
- 2. Accordingly, for conversions of jacketed DOT-111 tank cars equipped with only fiberglass insulation to DOT-117 specification cars, are applicants required to provide documentation of a worst case thermal analysis for crude oil and ethanol to show that they are capable of achieving the 49 CFR 179.18(a) performance standard?**

Finally, AAR is requesting an interpretation on how to determine the allowable tank plate thickness standard for a DOT-117 class car. AAR is seeking clarification that DOT considers the plate thickness allowed by the specification to be based on the minimum plate thickness for the type of car at the time of original construction. For example, a DOT 117R converted from non-jacketed CPC-1232 car would have a required base thickness of ½ inch rather than 7/16 inch, which is the published DOT-117R minimum shell thickness in general (179.202-13c).

- 3. For tank car conversions to a DOT-117R, does DOT consider the plate thickness allowed by the specification to be based on the minimum plate thickness for the type of car at the time of original construction?**

Thank you very much for your prompt attention to these matters. Please do not hesitate to contact me with any questions at 202-639-2262.

Sincerely,

A handwritten signature in black ink, reading "Kenneth B. Dorsey". The signature is written in a cursive style with a large, prominent "D" and "S".

Kenneth B. Dorsey
Executive Director of Tank Car Safety



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

SEP 18 2018

Kenneth B. Dorsey
Association of American Railroads
425 Third Street, SW
Washington, DC 20024

Reference No. 18-0036

Dear Mr. Dorsey:

This letter is in response to your March 13, 2018, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to specifications for DOT-111 and DOT-117 series tank cars.

We have paraphrased and answered your questions as follows:

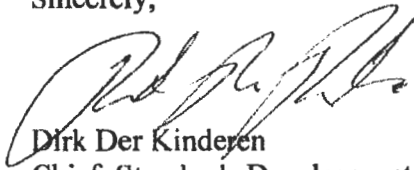
- Q1. You ask whether a DOT-111 tank car manufactured after October 1, 2015, is eligible to be retrofitted to DOT-117R or DOT-117P specification.
- A1. The answer is no. In accordance with § 174.310(a)(4), a newly manufactured tank car used to transport flammable liquids must be built to the new DOT-117 or DOT-117P specifications.
- Q2. Certain jacketed DOT-111 tank cars are equipped with fiberglass insulation, which is not an approved thermal protection system, in accordance with § 179.18(c). You ask whether these tank cars being retrofitted to the DOT-117 specification require documentation of a worst-case thermal analysis for crude oil and ethanol to show that they are capable of achieving the performance standard in § 179.18(a).
- A2. The answer is yes. When converting jacketed DOT-111 tank cars equipped with a thermal protection system not on the verification list, a thermal analysis must be provided that demonstrates the tank car can achieve the performance standard in § 179.18(a). In accordance with § 179.202-12(a), only cars that show they can meet this performance standard will be eligible for conversion to DOT-117P specification and need additional approval from Associate Administrator for Railroad Safety/Chief Safety Officer, Federal Railroad Administration (FRA).

Q3. You ask if the minimum plate thickness requirements for DOT-117R specification can be based on the minimum plate thickness requirement at the time of original construction.

A3. The answer is yes. In accordance with § 179.202-13(c), the minimum plate thickness for all tank cars manufactured to the DOT-117R is 7/16 of an inch. However, DOT-111 tank cars manufactured to the Association of American Railroads CPC-1232 standard have a minimum plate thickness of ½ an inch. Additionally, when calculating minimum allowable tank shell thickness in accordance with § 180.509(f), the original plate thickness at time of construction must be used for these calculations.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,



Dirk Der Kinderen
Chief, Standards Development Branch
Standards and Rulemaking Division