U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

DEC 13 2005

Mr. James H. Rader
Vice President, Technical Support
Services
AllTranstek LLC
1101 31st Street, Suite 200
Downers Grove, IL 60515-5650

Ref. No.: 05-0177

Dear Mr. Rader:

This is in response to your July 12, 2005 letter concerning the applicability of Part 179 of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) to tank cars. Your questions, and the answers to them, follow:

Q1. Does § 179.1(a), (b), and (e) limit the applicability of Part 179 to tank cars "marked" only a "DOT specification?

A1. Before responding directly to this question, several precursor elements must be stated. The "marking" definition in § 171.8 includes a "specification" . . . "required by this subchapter. . . ." This definition in the DOT regulations does not include a requirement that the specification be applied to the car in a particular manner. Applicable language in the Association of American Railroads Tank Car Manual (see Appendix C, 2.0) defines "marking" and "stamping" separately. Both 49 CFR Part 179 and Chapter 3 of the AAR Tank Car Manual require cars to be "marked" per Appendix C of the Manual and "stamped" with the as-built specification and other vital information (See §§ 179.100-20 and 179.200-24). It is the "stamping" that certifies that the car is built to the specification so indicated. Thus, it is reasonable to conclude, as PHMSA and FRA do, that the marking requirements § 179.1(e), insofar as they relate to the tank specification, and the certification of compliance to that specification, are directed to the stamping of the specification into the head of the tank car and not to the information applied by decal or paint per Appendix C.

Further, the Specifications for AAR Tank Car Tanks set out in Chapter 3 of the Tank Car Manual, state, for instance, that AAR 203W and AAR 211W cars are built in accordance with a referenced DOT specification except as otherwise provided in that chapter. (See Chapter 3, paragraph 3.1.1.) Under § 173.31(a) all tank cars used to transport a hazardous material must meet the requirements of the specification to which the tank was built. Given the interwoven requirements of the HMR, including Part 179, and the AAR Tank Car Manual, it is not possible to say that§ 179.1(a), (b), and (e) limit Part 179 to only those cars "marked," i.e., stamped, to a DOT specification. Rather, both the HMR and the Tank Car Manual must be read to give the fullest scope and interpretation to each.

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178.345-1
178.345-14
179.1

Q2. Given the answer in Question (1) above, do the requirements of Part 179 apply to any tank car constructed and marked to an "AAR" specification, including the limitations on the maximum gross weight on rail at 263,000 pounds?

A2. As specified in § 179.1(a) Part 179 prescribes the specifications for tanks that . . . are to be marked with a DOT specification. As stated in A1, the crucial marking requirement for tank car tanks was the specification stamped into the heads of the tank. Thus, the capacity and gross weight limitations established in § 179.13 (See also § 173.26) apply to tank cars whose tanks are head-stamped with a DOT specification. Conversely, "the weight limitations of § 179.13 do not apply to Class AAR-211W tank cars." (See paragraph 3.1.1, Chapter 3, AAR Tank Car Manual).

Q3. Do the requirements of Part 179 apply to tank cars constructed to a "DOT" specification and marked (stenciled) to an "AAR" specification? This is similar to the variable specification plate for highway cargo tanks in §§ 178.345-1(j) and 178.345-14(e).

A3. Because the crucial "marking" for the specification of a tank car tank is the head-stamped specification and not an alternative specification painted or decaled on the car, a tank car tank stamped with a DOT specification is subject to the requirements of Part 179. There is no railroad tank car analogous to the highway cargo tank "variable specification plate."

I hope this information is helpful. If you have further questions, please do not hesitate to contact this office.

Sincerely,

Hattie L. Mitchell

Hattie L. Mitchell
Chief, Regulatory Review and Reinvention
Office of Hazardous Materials Standards.

Pollack
§179.1
§178.345-1
§178.345-14
Marking
05-0177

ALLTRANSTEK
TRANSPORTATION MANAGEMENT & CONSULTING

James H. Rader
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July 12, 2005

Robert A. McGuire
Associate Administrator for Hazardous Materials Safety
Research and Special Programs Administration
U.S. Department of Transportation
400 Seventh Street, S.W.
Attention: DHM-31
Washington, D.C. 20590-0001

Re: Request for Interpretation

Dear Mr. McGuire:

I am writing to request an interpretation on the applicability of the Hazardous Materials Regulations (HMRs) with respect to tank cars marked to an Association of American Railroads specification.

The HMRs authorize the transportation of hazardous materials, with low to medium hazards, in tank cars conforming to specifications developed by the Association of American Railroads (AAR).[1] With respect to a tank car marked to an "AAR" specification, the HMRs require that the tank conform to the specification to which it was constructed.[2] Based on these federal requirements, I would like your interpretation with respect to the following:

1. Does 49 CFR 179.1(a), (b), and (e) limit the applicability of Part 179 to tank cars "marked" only to a "DOT" specification?

2. Given the answer in question (1) above, do the requirements of 49 CFR 179 apply to any tank car constructed and marked to an "AAR" specification; including the limitations on the maximum gross weight on rail at 263,000 pounds?

3. Do the requirements of 49 CFR 179 apply to tank cars constructed to a "DOT" specification and marked (stenciled) to an "AAR" specification? This is similar to the variable specification plate for highway cargo tanks in 49 CFR 178.345-1(j) and 178.345-14(e).

If you need any further information, please let me know.

Sincerely,

James H. Rader
Vice President Technical Support Services

[1] See 49 CFR 173.240, 173.241, and 173.242.
[2] See 49 CFR 173.31(a)(1) and 180.507(a).

CHAPTER 3. SPECIFICATIONS FOR AAR TANK CAR TANKS

3.1 (AAR.100) Specifications Applicable to Class AAR-203W and AAR-211W Tank Car Tanks

3.1.1 (AAR.100-1) General

Class AAR-203W and AAR-211W tanks must be built in accord with the applicable DOT-103W or DOT-111W specification shown in Table 3.1 (see DOT 179.200 and 179.201) except as provided in the following paragraphs. Where AAR paragraph numbers are omitted, the provisions of DOT 179.200 and 179.201 apply. The weight limitations of 179.13 do not apply to Class AAR-211W tank cars.

Table 3.1 DOT specifications for Class AAR-203W and AAR-211W tanks

AAR Specification	Applicable DOT Specification
AAR-203W	DOT-103W
AAR-203DW	DOT-103DW
AAR-211A60W1	DOT-111A60W1
AAR-211A60ALW1	DOT-111A60ALW1
AAR-211A100W1	DOT-111A100W1
AAR-211A100W6	DOT-111A100W6
AAR-211A100ALW1	DOT-111A100ALW1

3.1.2 (AAR.100-2) Approval

For the procedure for securing approval, see paragraph 1.4.

3.1.3 (AAR.100-4) Insulation

3.1.3.1 If insulation is applied, insulating material must be approved.

3.1.3.2 Insulation must be covered with a jacket made of approved material that is applied so as to be weather tight.

3.1.3.3 The exterior surface of a carbon steel tank and the inside surface of a carbon steel jacket must be given a protective coating.

3.1.4 (AAR.100-10) Welding

3.1.4.1 Radioscopic examination of welded joints of carbon steel or alloy steel tanks is not a requirement of this specification.

3.1.4.2 Welded joints of aluminum tanks must be radioscoped in accord with Appendix W.

3.1.5 (AAR.100-11) Postweld Heat Treatment

The portions of carbon steel tanks to which anchorage or draft sills are attached must be postweld heat treated in accord with Appendix W.

3.1.6 (AAR.100-16) Gauging Devices, Top Loading and Unloading Devices, Venting Devices, and Air Inlet Devices

When gauging devices, top loading and unloading devices, and venting and air inlet devices are installed, protective housing is not required.

3.1.7 (AAR.100-17) Bottom Outlets

Bottom outlets on AAR specification tanks must conform to DOT-179.200-17 except that external valves may be of any approved design.

State	County	Location	Map No.	State map repository	Local map repository	Effective date of identification of areas which have special flood hazards
Rhode Island	Providence	Providence	T 44 007 0190 01 T 44 007 0190 02	Rhode Island, etc.—Continued	Graphics Section, Department of Planning and Urban Development, 410 Howard Bldg., 10 Dorrance St., Providence, R.I. 02903.	Sept. 8, 1970.
Do	Washington	South Kingstown	T 44 009 0205 01 through T 44 009 0205 04	do	Town Hall, 66 High St., Wakefield, R.I. 02879.	Do.
South Carolina	Charleston	Folly Beach	T 45 019 0875 01	South Carolina Water Resources Planning and Coordinating Committee, 1411 Barnwell St., Columbia, S.C. 29201. South Carolina Insurance Department, Federal Land Bank Bldg., 1401 Hampton St., Columbia, S.C. 29201.	Office of the Building Official, 17 Center St., Folly Beach, S.C. 29439.	Do.
Texas	Harris	Shoreacres	T 48 201 6370 01 T 48 201 6370 02	Texas Water Development Board, Post Office Box 12386, Capitol Station, Austin, Tex. 78701. Texas Insurance Board, 1110 San Jacinto St., Austin, Tex. 78701.	Office of the Mayor, City Hall, 610 Shoreacres Blvd., La Porte, Tex. 77571.	Do.
Virginia		Virginia Beach	T 51 810 2540 01 through T 51 810 2540 29	Department of Conservation and Economic Development, Division of Water Resources, 911 East Broad St., Richmond, Va. 23219. Virginia Insurance Department, 700 Blanton Bldg., Post Office Box 1157, Richmond, Va. 23209.	Office of the City Clerk, City Hall, Virginia Beach, Va. 23456.	Do.

(National Flood Insurance Act of 1968 (title XIII of the Housing and Urban Development Act of 1968), effective Jan. 28, 1969 (33 F.R. 17804, Nov. 28, 1968), as amended (secs. 408–410, Public Law 91–152, Dec. 24, 1969), 42 U.S.C. 4001–4127; Secretary's delegation of authority to Federal Insurance Administrator, 34 F.R. 2680, Feb. 27, 1969; and designation of Acting Federal Insurance Administrator effective July 22, 1970, 35 F.R. 12360, Aug. 1, 1970)

Issued: September 8, 1970.

CHARLES W. WIECKING,
Acting Federal Insurance Administrator.

[F.R. Doc. 70-11840; Filed, Sept. 8, 1970; 8:45 a.m.]

Title 49—TRANSPORTATION

Chapter I—Hazardous Materials Regulations Board, Department of Transportation

[Docket No. HM-38; Amendment No. 179-4]

PART 179—SPECIFICATIONS FOR TANK CARS

Restriction of Capacity of Tank Cars and Interlocking Couplers

The purpose of this amendment to the Hazardous Materials Regulations of the Department of Transportation is to restrict the gross weight and volume capacity of, and require interlocking couplers on all new tank cars used to transport hazardous materials.

On December 11, 1969, the Hazardous Materials Regulations Board published Docket No. HM-38; Notice No. 69-31 (34 F.R. 19553) proposing to amend Part 179 of the Hazardous Materials Regulations as indicated above. In that notice, the Board stated its concern with the increasing number of railroad accidents involving tank cars transporting hazardous materials in which the tank released its contents, through either puncture or rupture. Reference was made to the mounting death and personal injury rate resulting from these accidents, as well as the property loss. Interested persons were afforded an opportunity to participate in this rule making.

Regarding the imposition of a capacity limitation of 34,500 gallons, many respondents noted that large capacity tank cars tended to reduce the hazard to the public by reducing the number of cars required for a given volume movement. No consideration was expressed for the fact that increased capacity will result in a greater hazard in the event that the tank car is punctured or ruptured in a derailment. Large capacity tank cars also increase the hazard of soil, water and air pollution.

Many responses were addressed to the question of limiting the total gross weight on rail to 263,000 pounds. Some of the data discussed the validity of a weight limitation as a control measure to improve railroad safety, focusing primarily on weight-related causative accident factors and the effects on kinetic energy of the tank car.

Causative accident factors show that stress failures in track and car parts account for approximately 50 percent of all rail accidents. The Board believes that the relationship between such stress failures and car weight is direct.

In every example offered citing rail loads in excess of the proposed limit, particular mention was made of the special routing clearances and controls exercised over the movement of these cars. Such special measures are not present in normal tank car movement, which is the situation to which the Board must address itself. Only one response offered design data which showed that due consideration had been given to overbuilding a tank and running gear to obtain the margin of safety which is required by good engineering practice.

Weight related stress failures are known to have occurred in existing "100 ton" capacity, 263,000 pounds gross weight tank cars which have been in service for a period of years. "Fix" programs to correct buckling and fatigue cracking at both ends of stub sills on underframeless cars have been underway for several years. It is necessary to have an upgrading of the present tank car fleet in order to withstand the rigors of the normal railroad environment over the expected life of the tank cars. This upgrading must be accomplished before considering allowing increase of the stress loads on equipment and the rail plant caused by heavier cars.

One respondent addressed himself to the influence of weight on kinetic energy of the tank car and mentioned the ability of a larger mass to absorb a larger amount of kinetic energy. Increasing the weight of the tank car produces a linear increase in its kinetic energy at equal velocity. This increased kinetic energy increases the likelihood that the tank will be punctured or will rupture in an accident. Therefore, the Board believes that limiting the maximum weight of a tank car will reduce incidents of puncture and rupture.

Inadequate consideration has been given in current design practice to the selection of material thicknesses to compensate for greater kinetic energy levels encountered as tank car weight increases. As train operating speeds increase, this kinetic energy increases exponentially.

Sill design has been held nearly constant despite change in tank car weight and capacity, and shell thickness has varied only as a function of the tensile strength of materials and tank diameter. It is apparent that the weight (stress) related elements have not been strengthened as a direct function of capacity. The Board believes that this, in effect, results in a lower factor of safety in larger capacity tank cars as related to smaller capacity cars.

Virtually all respondents mentioned the economic impact of the proposed weight-capacity limitations. It must be recognized that the cost of accidents is also a part of the national distribution costs and is reflected in freight rates.

In order to accurately determine the economic effect of this rule making, the Board retained an independent expert to analyze the overall costs of "large

capacity" tank cars as related to "smaller capacity" tank cars. The following table summarizes his findings:

SUMMARY OF TANK CAR TRANSPORTATION COSTS

LIQUEFIED PETROLEUM GAS

	Dollars per ton	Cents per gallon
500-mile movement:		
70-ton capacity	8.53	2.0151
100-ton capacity	7.22	1.6957
125-ton capacity	6.71	1.5757
140-ton capacity	7.65	1.7983
1,000-mile movement:		
70-ton capacity	13.62	3.1777
100-ton capacity	11.54	2.7111
125-ton capacity	10.84	2.5465
140-ton capacity	11.98	2.8165
1,500-mile movement:		
70-ton capacity	18.47	4.3403
100-ton capacity	15.86	3.7265
125-ton capacity	14.97	3.5173
140-ton capacity	16.32	3.8347

The table indicates that costs involved in utilizing the "100ton" capacity tank car differ little from those costs involved in utilizing the "125ton" capacity tank car. The "100ton" capacity tank car actually offers some cost savings over the "140ton" capacity tank car. The Board believes public safety warrants the slight reduction in economic efficiency which results from utilizing "100ton" capacity tank cars in place of "125ton" capacity tank cars.

For the above reasons, the Board concludes that the proposed restrictions on tank car weight-capacity are in the public interest. Until the present problems involved in using the "100ton" capacity tank cars are resolved and until evidence is presented to show that increased stress levels associated with higher unit loadings on the rail plant and tank car equipment at prevailing speeds have been adequately compensated for, this will remain the Board's conclusion.

The Board further believes that the application of interlocking automatic couplers on all new tank cars will materially improve safety by reducing the incidence of tank head puncture and tank car pileup.

Since the date of Notice No. 69-31, there have been 19 accidents involving tank cars transporting hazardous materials in which the contents have been released causing severe hazard. One such accident occurred at Crescent City, Ill., on June 21, 1970. The continuing occurrence of accidents of this nature makes evident the need for action. The Hazardous Materials Regulations Board is aware that research efforts are being made by the affected industries, and that the Federal Railroad Administration has entered into contracts to study certain aspects of tank car design and accident behavior. It is hoped that these efforts will develop improved tank designs and methods of construction, including specialized hardware, which will enable all newly built tank cars to be able to safely transport hazardous materials. Until the results of these research activities are known, the Board believes that the proposed steps must be taken to prevent proliferation of the problems resulting from the continued construction of large capacity tank cars exceeding 34,500 gallons. While the Board recognizes that the Crescent City accident involved tank cars having capacities in the 30,000-gallon range, it believes that larger capacity cars would have released much greater quantities of hazardous materials, with consequently increased fire hazard and property damage. In addition, the added weight on rail would have increased the impact forces in the derailment and might well have resulted in additional punctures, fires, and violent ruptures.

Several responses noted the lack of a readily acceptable definition of the term "rebuilt tank car." This term has been deleted from the amendment pending the Board's further review.

The Board believes that by requiring installation of interlocking couplers that will resist car telescoping and jackknifing in derailments and emergency stops, the incidence of tank head and side puncture will be markedly reduced. At Crescent City, a tank head puncture caused the eventual conflagration and violent ruptures.

In consideration of the foregoing and for reasons discussed in the preamble of Notice No. 69-31, 49 CFR Part 179 is amended as follows:

(A) In the table of contents, §§ 179.13 and 179.14 are added to read as follows:

Sec.
179.13 Tank car capacity and gross weight limitation.
179.14 Tank car couplers.

(B) § 179.13 is added to read as follows:

§ 179.13 Tank car capacity and gross weight limitation.

Tank cars built after November 30, 1970, must not exceed 34,500 gallons capacity or 263,000 pounds gross weight on rail. Existing tank cars may not be converted to exceed 34,500 gallons capacity or 263,000 pounds gross weight on rail.

(C) § 179.14 is added to read as follows:

§ 179.14 Tank car couplers.

All tank cars built after November 30, 1970, must be equipped with interlocking automatic couplers that will resist car telescoping and jackknifing in derailments and emergency stops and that are approved by the Federal Railroad Administrator.

This amendment is effective November 13, 1970.

(Secs. 831-835, Title 18, United States Code; sec. 9, Department of Transportation Act, 49 U.S.C. 1657)

Issued in Washington, D.C., on September 2, 1970.

HAROLD C. HEISS,
Acting Administrator,
Federal Railroad Administration.

[F.R. Doc. 70-11887; Filed, Sept. 8, 1970; 8:49 a.m.]

Chapter X—Interstate Commerce Commission

SUBCHAPTER A—GENERAL RULES AND REGULATIONS

[Fifth Revised S.O. 1041]

PART 1033—CAR SERVICE

Distribution of Boxcars

At a session of the Interstate Commerce Commission, Railroad Service Board, held in Washington, D.C., on the 2d day of September 1970.

It appearing, That an acute shortage of certain plain boxcars exists on the railroads named in section (a) paragraph (1) herein; that shippers located on the lines of these carriers are being deprived of such cars required for loading, resulting in a severe emergency and causing grain elevators to be unable to accept newly harvested grain, or to store grain on the ground, thus creating economic loss; that present rules, regulations, and practices with respect to the use, supply, control movement, distribution, exchange, interchange, and return of boxcars owned by these railroads are ineffective. It is the opinion of the Commission that an emergency exists requiring immediate action to promote car service in the interest of the public and the commerce of the people. Accordingly, the Commission finds that notice and public procedure are impracticable and contrary to the public interest, and that good cause exists for making this order effective upon less than 30 days' notice.

It is ordered, That:

§ 1033.1041 Service Order No. 1041.

(a) *Distribution of boxcars.* Each common carrier by railroad subject to the Interstate Commerce Act shall observe, enforce, and obey the following rules, regulations, and practices with respect to its car service:

(1) Return to owners empty, except as otherwise authorized in subparagraph (2) of this paragraph, all plain boxcars which are listed in the Official Railway Equipment Register, I.C.C. R.E.R. 376, issued by E. J. McFarland, or reissues thereof, as having mechanical designation XM, with inside length 44'6" or less and equipped with doors less than 9 feet wide, owned by the following railroads:

Burlington Northern Inc.
Chicago and North Western Railway Co.
Chicago, Milwaukee, St. Paul and Pacific Railroad Co.
Soo Line Railroad Co.

(2) Boxcars described in subparagraph (1) of this paragraph, may be loaded to stations on the lines of the owning railroad, or to any other station which is closer to the owner than the station at which loaded. After unloading at a junction with the car owner such cars shall be delivered to the car owner at that junction, either loaded or empty.

(3) In determining distances to the car owner from the points of loading or unloading, tariff distances applicable via

Pollack, Arthur <PHMSA>

From: Phemister, Tom <FRA>
Sent: Monday, December 12, 2005 12:15 PM
To: Pollack, Arthur <PHMSA>
Cc: Schoonover, William <FRA>; Mitchell, Hattie <PHMSA>
Subject: RE: Interpretive request by James Rader

Arthur:

Thank you for sending this. If I could make one change, and it is my fault for not catching it on the draft I sent you, I'd change the second sentence in the letter to read: Your questions, and the answers to them, follow:" My reasoning is that the current draft does not paraphrase Mr. Rader's changes. Again, *mea culpa* for not catching this sooner.

Just as a reminder, I'd appreciate a .pdf of the signed letter so we can easily respond to similar interpretive requests.

If anyone above you and me on the food chain makes substantive changes, please call or write. Thanks.

Tom

> -----Original Message-----
> **From:** Pollack, Arthur <PHMSA>
> **Sent:** Monday, December 12, 2005 8:31 AM
> **To:** Phemister, Tom
> **Cc:** Schoonover, William; Mitchell, Hattie <PHMSA>
> **Subject:** RE: Interpretive request by James Rader
>
> Tom- Thank you for your input and help on the Jim Rader letter. Attached is the latest version we have put on grid. We have made no substantive changes to your input but are sending you this updated version (with minor format edits) per your request.
>
> -Arthur
>
> > -----Original Message-----
> > **From:** Phemister, Tom <FRA>
> > **Sent:** Wednesday, December 07, 2005 9:58 PM
> > **To:** Pollack, Arthur <PHMSA>
> > **Cc:** Schoonover, William <FRA>; Mitchell, Hattie <PHMSA>
> > **Subject:** Interpretive request by James Rader
> >
> > On November 8, you sent me a draft letter in response to an inquiry by James Rader of AllTranstek about marking tank cars. Thank you for the opportunity to comment.
> >
> > I am attaching an alternative text with which FRA concurs; because of the sensitive nature of this subject (more later) FRA requests the opportunity to see and agree to any modifications made to the attached text. The alternative text is attached in both Word and WordPerfect formats.
> >
> > Mr. Rader raises a very interesting set of questions and because both FRA's Staff Director, Hazardous Materials, and I have known the author for many years, we understand that the issue beneath the issue that he formally raises is really the key. Mr. Rader talked about "marking" tank cars and phrased his questions that way. The crucial missing step in his questions, but one which DOT must address, is the head stamping required by 179.100-20 and 179-200-24 (non-pressure and pressure cars, respectively). It is clearly understood in the tank car industry, and FRA has so enforced, that the specification stamped on the tank head establishes the specification to which the car was built. Cars

may be built as "DOT-specification" cars and stenciled on the side with an "AAR-specification," but they are still, at base, DOT cars. Car owners and shippers often make the change in order to take advantage of AAR's somewhat less stringent requirements for service equipment (valves) and for other reasons of perceived economic necessity. What they cannot do by merely painting a different specification on the car is circumvent the quantity and weight restrictions in 173.26 -- at least not without a Special Approval. DOT and AAR requirements on this point are quite different: 173.26 limits (via 179.13) the capacity and gross weight of DOT-specification cars while Chapter 3 (at 3.1.1) of the AAR Tank Car Manual specifically states that "the weight limitations of 179.13 do not apply to Class AAR 211W tank cars."

FRA's continuing qualification requirements for DOT-specification cars form the basis for Part 180, Subpart F. We cannot, as stewards of the railroad hazardous materials safety program for DOT, allow drastically heavier cars to operate without extra oversight -- that is a primary purpose of the re-qualification requirements at the heart of Part 180, Subpart F and a primary purpose of the requirement that DOT tank cars operated above the limits of 179.13 receive a Special Permit. The Special Permit process has enabled FRA to require structural and equipment betterments beyond the bare minimums of the DOT-specification and that, in turn has contributed to the excellent safety record of the current tank car fleet.

Again, I appreciate this opportunity to apprise the industry of the sovereignty of the DOT-specifications for tank cars contained in Part 179. They have, and with the continued efforts of FRA and PHMSA, will continue to represent the state-of -the -art in bulk packaging for moving hazardous materials by railroad.

Please call if you have any questions.

Tom Phemister

202 493 6050