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Mr. Daniel M. Gillen, Deputy Director
Division of Waste Management and Environmental Protection
MS T7E18
US Nuclear Regulatory Commission
Washington, DC 20555

December 21, 2005

SUBJECT: Clarification of the Contamination Limits US NRC and US DOT

Dear Mr. Gillen,

This letter requests NRC's consideration of whether the contamination limit of 49 CFR 173.443 or that of Reg. Guide 1.86 is the appropriate standard for release of conveyances (or bulk intermodal and cargo containers usable as conveyances) for unrestricted use from NRC (or Agreement State) licensed facilities.

Specifically, this letter requests clarification of the responsibilities and obligations of a transporter to meet limits on radioactive contamination for the unrestricted release of packages and conveyances expressed in US Nuclear Regulatory Commission guidelines and US Department of Transportation (DOT) Regulations.

BACKGROUND

MHF Logistical Solutions (MHF) is a transportation logistics service provider. As part of its service, MHF provides clients with transportation equipment such as railroad cars, intermodal containers, and cargo containers used to transport radioactive materials. MHF's equipment consists of "packages" and "conveyances" as those terms are defined in 10 CFR 71.4 and corresponding DOT rules 49 CFR 173.4. Typically, the radioactive materials are wastes being transported for disposal. MHF does not take possession of radioactive material as part of the transportation function, and does not possess a radioactive materials license.

It has been MHF's practice to require its clients to return equipment in a condition which meets the unrestricted release criteria of US NRC Regulatory Guide 1.86, since it is MHF's understanding that this is the standard for unrestricted release of potentially contaminated items to the public.

However, the US DOT requirements of 49 CFR 173.443 state that conveyances can be released for general use in transportation at higher contamination levels. This requirement is often cited by MHF's NRC (or Agreement State) licensee customers as an acceptable contamination standard for return of conveyances to us for general use. In some cases, MHF's client's Agreement State license specifically exempts conveyances used for commercial transport of radioactive waste from 1.86 guidelines; leaving 49 CFR 173.443 as the only apparently applicable standard for unrestricted release.

The DOT recently defined "contamination" in 49 CFR 173.403 as the presence of radioactivity on a surface in quantities greater than 0.4 Bq/cm2, which is more restrictive than the 0.83 Bq/cm^2 average limit expressed in Regulatory Guide 1.86; however, it appears DOT's 0.4 Bq/cm^2 limit applies only to direct-handled packages, and that the higher allowable contamination limits of 4 Bq/cm^2 in 49 CFR 173.443(a) still apply to release of conveyances for use in transportation. A recent request to the DOT to confirm this interpretation is attached.

SAMPLE IMPACTS

The apparent inconsistency between NRC and DOT contamination guidelines/requirements presents significant uncertainties for compliance, and has several adverse impacts on transportation when reusable containers or conveyances are used, specifically:

1. Conveyances or containers released by one NRC (or Agreement State) licensed facility to the DOT limits are routinely rejected at the gate by other licensed facilities who assert that Reg. Guide 1.86 limits apply to conveyances entering their facility. The reporting requirements for such an event by the licensee and/or the transporter are unclear.

   Question: Is a NRC (or Agreement State) licensed facility required to refuse entry onto its premises of a conveyance that exhibits contamination in excess of Reg. Guide 1.86 levels, but within DOT's 49 CFR 173.443 contamination limits?

   Question: What, if any, reporting obligations are imposed on a licensee and/or transporter under the above circumstances?

2. The authority of an unlicensed transporter to receive conveyances contaminated with licensed material above the levels in NRC Reg. Guide 1.86, but below the contamination levels of 49 CFR 173.443 is unclear.

Question: What, if any, licensing obligations attach to a transporter who comes into possession of licensed material *as surface contamination on a conveyance*, where the surface contamination exceeds Reg. Guide 1.86 but is within contamination limits of 49 CFR 173.443? Would the transporter's licensing obligations be any different for byproduct or special nuclear material, as opposed to source material?

3. Similarly, an unlicensed transporter may be required to decontaminate conveyances that meet DOT 173.443 limits to achieve Reg. Guide 1.86 limits. . By doing so, the potential exists for an unlicensed transporter to generate waste containing licensed material through routine cleaning of railcars that already meet DOT's contamination limits for use in general commerce.

   Question: Does NRC consider the transporter's decontamination effort to be "waste generation" of licensed material? Does it make any difference whether the contamination originates from source, byproduct or special nuclear material as those terms are defined by NRC?

   Question: If a transporter generates a waste containing licensed material by decontaminating conveyances meeting 49 CFR 443 contamination limits to meet Reg. Guide 1.86 levels, is it the NRC licensee or the transporter who is responsible for the release of licensed material?

4. It is unclear if contamination controls are needed to perform repairs on railcars or containers released into commerce below the DOT standards, but exceeding Reg. Guide 1.86 limits.

   Question: Where an unlicensed transporter performs maintenance on conveyances or packages meeting DOT 49 CFR 443 limits but exceeding Reg. Guide 1.86 limits, is the transporter subject to the radiation protection and contamination control requirements of NRC, DOT or the Occupational Safety and Health Administration?

5. Unlicensed 'unimportant quantities of source material' may contaminate conveyances above Reg. Guide 1.86 limits, and disposal facilities receiving such unlicensed material routinely release conveyances to the DOT limits of 173.443. However, determination of the administrative status of the material may be impossible when contamination is detected by a subsequent transporter or at an NRC licensed facility.

   Question: Where conveyances that are contaminated with unimportant quantities of source material generated by a non-NRC (or Agreement State) licensee above Reg. Guide 1.86, but below DOT's 49 CFR 443 limits, which authority – NRC (or Agreement State), or relevant State rules applicable to naturally occurring radioactive material (NORM) has jurisdiction over this material?

SUMMARY

The differences in allowable contamination limits between the NRC and DOT present considerable challenges to disposal facilities and transportation providers supplying services and equipment to both licensed and unlicensed entities transporting radioactive material.

The DOT contamination limit for releasing conveyances to general commerce in 49 CFR 173.443 appears to provide satisfactory protection to the public for transportation purposes, and to have the support of the IAEA. It also provides a suitable and consistent standard for contamination that can be uniformly applied to conveyances used for unlicensed as well as licensed material.

MHF requests NRC responses to the specific questions above, as well as general guidance about the acceptability of using 49 CFR 173.443 contamination guidelines for unrestricted release of conveyances in lieu of the contamination guidelines of Reg. Guide 1.86.

CONCLUSION

Please feel free to contact me at (724) 772-9800, ext. 5560 if you have any questions about this request. Due to the complex nature of our inquiries, MHF would be pleased to meet and discuss potential resolutions of our issues before any formal response is made by NRC. Thank you for your assistance.

Respectfully submitted,

Kurt Colborn
Director, Technical Services
MHF Logistical Solutions

cc:

Envirocare of Utah, LLC: Jeff Gardner
US DOT PHMSA: Edward Mazzullo, Rick Boyle, Fred Ferate

ATTACHMENT

DOT Interpretation Request

LOGISTICAL SOLUTIONS

800 Cranberry Woods Drive, Suite 450, Cranberry Township, PA 16066 T 724.772.9800 F 724.772.9850 W www.mhfls.com

Mr. Edward Mazzullo
Director of Hazmat Standards
USDOT/PHMSA, Suite 8422
Office of Hazardous Materials Safety
400 7th Street, SW
Washington, DC 20590-3012

December 21, 2005

SUBJECT: Clarification of the Contamination Limits of 49 CFR 173.403 and 173.443

Dear Mr. Mazzullo,

This letter requests clarification of the limits on radioactive contamination limits for packages and conveyances as described in the definition of contamination in 49 CFR 173.403, and in the contamination control provisions of 49 CFR 173.443.

BACKGROUND

We cite the following information in this request for clarification (attached):

a. DOT Interpretation Reference 00-0304: Indicates that a railcar used to transport radioactive materials can be released for general use if the contamination limits of 173.443(c) are met {less than 0.5 mrem/hour and less than 4 Bq/cm^2 beta-gamma and low-toxicity alpha, 0.4 Bq/cm^2 other alpha}.

b. Page 3643 of the January 26, 2004 Federal Register, preamble to the Harmonization Rules: States that a conveyance must be released and surveyed in accordance with 173.443(c) prior to unrestricted release.

c. DOT Interpretation Reference 05-0094: States that (A6) an empty container contaminated above the limit of 173.403 {4 Bq/cm^2 beta-gamma and low-toxicity alpha, 0.4 Bq/cm^2 other alpha} must be transported in accordance with 173.428.

The cited information [c.] suggests that an empty container contaminated above the limits of 173.403 must either be considered a surface contaminated object or be shipped as empty in accordance with 173.428. That is, a contaminated (above 173.403) empty container is subject to the requirements of the hazardous materials regulations (HMR).

However, if the container is a conveyance (e.g. an intermodal, cargo container, or railcar) it can be released for unrestricted use if contamination is up to 10 times the 173.403 contamination limit (and remains below the contamination and dose limits of 173.443 as indicated in a. and b.).

REQUESTED CLARIFICATIONS

Please confirm the following interpretation of the cited regulations:

1. An empty packaging is considered contaminated if survey readings exceed the levels in the definition of contamination of 173.403, provided that the packaging is not a conveyance.

2. An empty conveyance (e.g. a gondola railcar), or bulk packaging large enough to be a conveyance (e.g. an intermodal or cargo container) is not considered contaminated until the levels of 173.443 are reached, and is exempt from further regulation by the HMR below those levels.

3. An empty gondola railcar, used to ship radioactive material packages is exempt from further regulation under the HMR if contamination levels are confirmed to be below those required by 173.443(c).

4. An empty gondola railcar used to ship radioactive materials within a liner serving as the barrier to contamination (such as a Super Load Wrapper™) is exempt from further regulation under the HMR if contamination levels are confirmed to be below those required by 173.443(c).

5. Intermodal and cargo containers can be considered conveyances for the purposes of choosing the appropriate contamination control limit, even if these containers are transported on a railcar for all or part of their transportation.

6. The contamination limits of 173.443 apply to conveyances regardless of whether the conveyance was used in an exclusive use shipment in accordance with 173.443(b) [an apparent prerequisite of 173.443(c)].

7. Compliance with the contamination requirements for a non-exclusive use shipment is the shipper's responsibility. Post-shipment surveys of conveyances used for general shipping [non-exclusive use, not utilizing the provisions of 173.443(b)] are not required, and may be performed at the consignee's discretion.

8. Contamination levels in 173.403 and 173.443 are limits on contamination on the surface of the package, empty packaging, or conveyance. The default factor for determining non-fixed surface contamination is 10 times the level measured on the wipe.

9. Contamination, as defined in 173.403, can be measured by a direct reading with an appropriate instrument; separate fixed and non-fixed measurements are not required.

10. The terms "general use" and "unrestricted release" as used in references a. and b. above both mean *"for general use in commerce, exempt from further regulation under the HMR"*. Please confirm these terms do not mean *"free from exclusive use controls, but still subject to the requirements of the HMR"*.

In addition to the cited clarifications and references, a copy of a parallel request to the NRC for clarification is also attached to this letter.

Please feel free to contact me at (724) 772-9800, ext. 5560 if you have any questions about this request. Thank you for your assistance.

Respectfully submitted,

Kurt Colborn
Director, Technical Services
MHF Logistical Solutions

cc:

Envirocare of Utah: Jeff Gardner
US NRC: Dan Gillen, Dominic Orlando
US DOT PHMSA: Rick Boyle, Fred Ferate

ATTACHMENT A

DOT Interpretation Reference 00-0034

U.S. Department
of Transportation
**Research and
Special Programs
Administration**

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

MAR 13 2001

Dr. M. E. Darrough
Director, Transportation Programs
United States Enrichment Corporation
6903 Rockledge Drive
Bethesda, MD 20817-1818

Reference No.: 00-0304

Dear Dr. Darrough:

This is in response to your letter and telephone conversation with Dr. Fred Ferate, Radioactive Materials Branch, Office of Hazardous Materials Technology, concerning the term "return to service" as used in 49 CFR 173.443(c).

As you were informed by Dr. Ferate, as used in § 173.443(c), the term "return to service" refers to the point at which a trailer or railcar used to transport a Class 7 exclusive use shipment is determined by the offeror to satisfy the prescribed contamination control limits and is released from exclusive use status and placed back in transportation for general use.

I hope this satisfies your request.

Sincerely,

Hattie L. Mitchell

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

000304

173.443

USEC
A Global Energy Company

Corbin
§173.443(c)
RAM
00-0304

October 25, 2000

Edward Mazzullo, Director
Office of Hazardous Materials Standards
U. S. Department of Transportation
Room 8422
400 Seventh Street, S. W.
Washington, D. C. 20590-0001

Dear Mr. Mazullo:

This letter is written to request that the U. S. Department of Transportation (DOT) issue a written clarification of 49 CFR 173.443 (c), regarding "Contamination Control" and the specific term "*return to service.*" The United States Enrichment Corporation was given an oral interpretation of this regulation during an October 24, 2000 telephone conversation with Dr. Fred Ferate, technical support staff of DOT's Radioactive Materials Branch, Research and Special Programs Administration. Dr. Ferate indicated that "*return to service*" refers to the point at which a trailer or railcar is released from exclusive use status and is being returned to the vendor for general use. USEC concurs with this interpretation.

We are requesting a written clarification for our records for future reference. If there are questions concerning this matter, please contact me at (301) 564-3422 or USEC's Traffic Manager, Mr. Don McCarty at (740) 897-2668.

Sincerely,

M. Elizabeth Darrough, Ph.D.
Director, Transportation Programs

cc:
J. Adkins
R. Boyle, DOT
F. Ferate, DOT
L. Krause
D. McCarthy, PORTS
S. Penrod, PGDP

United States Enrichment Corporation
6903 Rockledge Drive, Bethesda, MD 20817-1818
Telephone 301-564-3200 Fax 301-564-3201 http://www.usec.com

ATTACHMENT B

Page 3643 of the January 26, 2004 Federal Register

SCO–I material, or suspected non-fixed contamination levels exceed the accessible surface non-fixed contamination limit, but measures are taken to ensure radioactive material is not released into the conveyance by making these surfaces inaccessible, thereby rendering the material fully compatible with the definition for SCO–I, then the material may be transported unpackaged in accordance with § 173.427(c).

The commenter also indicated that the LSA–I and SCO–I provisions addressed in paragraph 540 of TS–R–1 state that, when these materials are transported according to the provisions of paragraph 523, the marking "RADIOACTIVE LSA–I" or "RADIOACTIVE SCO–I" described in paragraph 540 is optional, and is not mandated by (the IAEA) regulation. The commenter encouraged DOT to permit similar flexibility in marking SCO and LSA materials. We interpret this to mean that the commenter would like to have the freedom to make exclusive use shipments of LSA–I or SCO–I without such markings.

We believe that, in accordance with past requirements for similar marking of domestic shipments of LSA or SCO that are required to be transported exclusive use, such markings serve the useful purpose of alerting emergency response personnel, Class 7 (radioactive) material is present in relatively low concentrations. We have therefore decided to retain this requirement. However, the comment focuses our attention on the lack of detail in § 173.427 in our proposed rulemaking concerning transport requirements for unpackaged LSA–I materials and unpackaged SCO–I. Therefore, in this final rule we have included wording in § 173.427(a)(4), (a)(6)(iii), and (a)(6)(vi) to indicate that unpackaged LSA–I and SCO–I are subject to the same transport controls as packaged LSA material and SCO.

Two commenters stated that the new definition for contamination and LSA–I will allow radioactive material to enter industrial and consumer goods. Another commenter stated that the LSA–I definition allowing exemption of materials having an estimated specific activity up to 30 times the exempt activity concentration should be eliminated because it fits the definition of volumetrically contaminated material and neither the NRC nor DOE currently allows for release or recycle of volumetrically contaminated radioactive materials.

We believe the commenters misinterpreted the proposed § 173.403 definition of LSA–I. No section of the proposed LSA–I definition provides an exemption, rather the sections provide bounding criteria of what may be considered LSA–I material.

A commenter stated that all ores, even if not intended to be processed, should be regulated because in the past certain companies have contaminated large areas from ores. As stated previously in Issue 2, we will continue to regulate natural materials and ores that are not intended to be processes for their radioactive content, when their specific activities are greater than ten times the activity concentration exemption values in § 173.436. One commenter stated that external dose rates for LSA and SCO should be required to be less than 1 mrem/year at 3 meters. We believe this comment is outside the scope of the rulemaking.

This commenter also stated there should be no exemptions for H–3 or C–14 in animal tissues. These exceptions have been removed in the final rule since the TS–R–1 exemption activity concentrations for these materials adopted in this final rule are 1×10^6 Bq/g (27 μCi/g) for H–3 and 1×10^4 Bq/g (0.27 μCi/g) for C–14 (*i.e.*, they are greater than the concentrations previously excepted). Note, however, that this does not mean that these materials would be exempt from the provisions of the HMR relating to other hazard classes.

Several commenters disagreed with the new rules that would allow LSA–I and SCO–I to be transported unpackaged, citing the conveyance could become contaminated. We agree that given the amounts of radioactive material contained in LSA–I and SCO–I materials there is a likelihood that cross-contamination of the interior of a conveyance used for unpackaged transport of these materials, in accordance with the proposed § 173.427(c), could occur. However, in order to prevent the spread of contamination to subsequent non-radioactive material shipments in the same conveyance, it is incumbent upon the carrier of an exclusive use shipment to ensure that the conveyance is surveyed and decontaminated, if necessary, in accordance with § 173.443(c), prior to unrestricted release of the conveyance. The carrier may perform such measurements, or these may be made by the consignee or other persons, through appropriate arrangements among the interested parties.

One commenter stated that it is not clear in the definition for "contamination" what is meant by the statement "Non-fixed (removable) radioactive contamination is not significant if it does not exceed the limits specified in § 173.443." We point out that our definition of contamination is similar to our definition of radioactive material, in that the definition designates a threshold value below which the material in question is not subject to the Class 7 hazardous materials transport regulations. In that context we agree that the statement referred to by the commenter is ambiguous and, if "Non-fixed (removable) radioactive contamination" were interpreted as referring to the physical (non-regulatory) definition of contamination, is redundant. Hence, we have removed this phrase from the definition of contamination.

The commenter also requested that the meaning of the terms "distributed throughout" and "estimated average specific activity" be clarified in the definition for LSA–I, and asked whether these terms are intended to be applied as discussed in NUREG–1608/RSPA Advisory Guidance 97–005 for LSA materials. The guidance concerning "distributed throughout" and "essentially uniformly distributed" would be appropriate as provided in NUREG–1608, "Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects." For packages containing at least 0.2 m^3 of LSA material, ten or more equal volumes no greater than 0.1 m^3 each, of objects or materials that are "distributed throughout," should not vary by more than a factor of ten. The specific activity among similarly defined volumes for materials that are "essentially uniformly distributed" should not vary by more than a factor of three. It should be noted that, where the LSA materials contain radionuclides in quantities less than 1 A_2, this determination may be made either quantitatively or qualitatively. The "estimated average specific activity" for radioactive material "distributed throughout" would be an arithmetic average specific activity of material where the range of specific activities does not vary by more than a factor of ten.

Issue 6: Uranium Hexafluoride (UF_6)

Background. Uranium hexafluoride (UF_6) packaging and transportation is regulated under both NRC and DOT requirements. The HMR contain provisions that govern many aspects of UF_6 packaging and shipment preparation. The NRC regulates fissile materials and Type B packaging designs for all materials. Since UF_6 may be a fissile material, it may also be regulated by the NRC.

ATTACHMENT C

DOT Interpretation Reference 05-0094

U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

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

JUL 20 2005

Mr. Kurt Colborn
Director, Technical Services
MHF Logistical Solutions
800 Cranberry Woods Drive, Suite 450
Cranberry Township, PA 16066

Ref No. 05-0094

Dear Mr. Colborn:

This responds to your April 18, 2005, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to Class 7 Radioactive Materials (RAM). Your questions are paraphrased and answered below:

Q1. You ask whether the definition for "contamination" represents a limit on the combined total fixed and non-fixed radioactive contamination.

A1. The answer is yes. As defined in § 173.403, contamination is the presence of radioactive substance on a surface in quantities in excess of 0.04 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters or 0.04 Bq/cm² for all other alpha emitters. Contamination exists in two phases.

Q2. You ask whether a default wiping efficiency of 0.10, or the actual wipe efficiency, may be used to convert the measurements to surface contamination levels when measuring non-fixed (removable) contamination transferred to a wipe.

A2. The answer is yes. As specified in § 173.443(a)(1), a default wiping efficiency of 0.10, or the actual wipe efficiency, may be used to determine the level of non-fixed radioactive contamination.

Q3. You ask whether the definition for "contamination" represents the lower limit of contamination, below which objects and empty containers are not subject to the radioactive material transport requirements of the HMR, provided radioactive contents are below at least one of the exemption values in the table found in § 173.436 or calculated by methods described in § 173.433.

A3. The answer is yes. A non-radioactive object or empty non-radioactive container with radioactive contamination below the definition of "contamination" in § 173.403 are not subject to the radioactive material transport requirements of the HMR.

Q4. You ask whether the definition for "contamination" represents the lower limit on contamination, above which contaminated items must be transported, at a minimum, as Surface Contaminated Objects (SCO).

A4. The answer is yes. A non-radioactive object with an actual radioactive contamination equal to or greater than the definition of "radioactive material" as defined in § 173.403 must be regulated as a Class 7 (Radioactive) hazardous material.

Q5. You ask whether the definition for "contamination" represents a lower limit of contamination for packagings that previously contained Class 7 radioactive materials and have been sufficiently cleaned in a manner that exempts them from marking and labeling requirements as specified in § 173.428.

A5. The lower limit of the definition for "contamination" applies to packagings that previously contained Class 7 radioactive materials provided the packaging contains no volume radioactivity, any contamination on the inner surfaces is below the definition for "contamination" as specified in § 173.403, and all labels and markings associated with its use as a RAM packaging are removed.

Q6. You ask whether empty containers that are contaminated above the limit specified in § 173.403 must be transported in accordance with § 173.428.

A6. The answer is yes. Empty containers that are contaminated above the limit specified in § 173.403 must be transported in accordance with § 173.428 when the conditions cited in § 173.428 are met, even if the contamination is on the outside of the container. If the conditions of § 173.428 cannot be met, such a container must be shipped in accordance with the appropriate requirements for transporting Class 7 (radioactive) material.

Q7. You ask whether the upper limit of permissible contamination on exposed surfaces of an empty packaging is determined in accordance with § 173.443.

A7. Provided the empty packaging is transported in accordance with § 173.428, the upper limit of permissible contamination on exposed surfaces of an empty packaging is determined in accordance with § 173.443.

Q8. You ask, when shipping a package of radioactive material, whether the contamination limits in § 173.443 apply, and whether the transportation requirements based on package contents take precedence over the definition of "contamination" found in §173.403. You also ask whether such a package can be transported without additional and potentially conflicting markings for SCO.

A8. The answer is yes. A package of Class 7 (radioactive) material may have exterior surface contamination up to the limits cited in §173.443, which are higher than the numbers listed in the definition of "contamination" in § 173.403.

As defined in § 173.403, a Surface Contaminated Object (SCO) is a solid object which is not itself radioactive, but which has radioactive material distributed on its surface. Thus, any material which is defined as "radioactive material" as specified in § 173.403, or any package containing such radioactive material, cannot also be an SCO even if it has radioactive material on its surface.

I hope this information is helpful.

Sincerely,

John A. Gale
Chief, Standards Development
Office of Hazardous Materials Standards

LOGISTICAL SOLUTIONS

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Mr. Edward Mazzullo
Director of Hazmat Standards
USDOT/RSPA DHM-10 Suite 8422
400 7th Street, SW
Washington, DC 20590-3012

April 18, 2005

SUBJECT: Interpretation for the Contamination Definition of 49 CFR 173.403

Dear Mr. Mazzullo,

The purpose of this letter is to request confirmation of our interpretation of the requirements of the definition of "contamination" in 49 CFR 173.403. Please confirm or clarify our understanding of the definition and its impacts on other aspects of 49 CFR 173. We'd appreciate an item-by-item interpretation of the following specific issues associated with the definition:

Measurement:

1. The 49 CFR 173.403 definition limits [0.4 Bq/cm^2 for beta, gamma, and low-toxicity alpha emitters, and 0.04 Bq/cm^2 for other alpha emitters] represent a limit on the *total* fixed and non-fixed radioactive contamination *combined*.
2. The contamination definitions of 49 CFR 173.403 apply to contamination *on a surface*. Hence, when measuring non-fixed contamination transferred to a wipe, a default wiping efficiency of 0.10, or the actual wipe efficiency, may be used to convert the wipe measurements to surface contamination levels {as described in 49 CFR 173.443(a)(1)}.

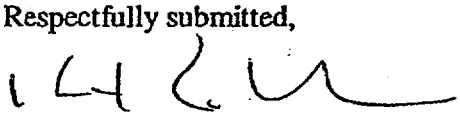
Shipping Impact:

3. The definition represents the lower limit on contamination, below which objects and empty containers are not subject to Class 7 hazardous materials transportation regulations, so long as any radioactive contents are below at least one of the exemption values in the table of 49 CFR 173.436.
4. The definition represents the lower limit on contamination, above which contaminated items must be transported at least as Surface Contaminated Objects (SCO).

5. When applied to containers that formerly contained Class 7 materials, the definition represents a lower limit on contamination, below which containers are considered sufficiently clean so as be exempt from the marking and labeling requirements for empty containers in 49 CFR 173.428.
6. Empty containers that are contaminated above the 173.403 limit must be shipped empty in accordance with 49 CFR 173.428.
7. The upper limit on permissible contamination on exposed surfaces of an empty container is determined in accordance with 173.443.
8. When shipping a package of radioactive material, the contamination limits of 49 CFR 173.443 apply, and transportation requirements based on the package contents take precedent over the contamination definition of 173.403. That is to say that a shipment of radioactive material that complies with 173.443, and is marked and labeled appropriate to its contents, can be transported without additional and potentially conflicting markings for SCO (SCO markings could be seen as necessary if content-required transportation doesn't take precedence over the contamination definition of 173.403).

Please feel free to contact me at (724) 772-9800, ext. 5560 if you have any questions about this request. Thank you for your assistance.

Respectfully submitted,



Kurt Colborn
Director, Technical Services
MHF Logistical Solutions