U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Ave, S.E.
Washington, D.C. 20590

MAY 0 9 2013

Mr. David Wilson
Packaging and Transportation Project Manager
Navarro Research and Engineering, Inc.
669 Emory Valley Road
Oak Ridge, TN 37830

Reference No.: 13-0047

Dear Mr. Wilson:

This is in response to your February 8, 2013 letter and requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). You reference a previous letter of interpretation, 11-0302 issued to you by this office in November of 2011, and ask several questions concerning the reuse of Type B and fissile material packagings. Your questions are paraphrased and answered as follows:

Q1. If packaging components are inspected and determined to require replacement in accordance with established acceptance criteria in the safety analysis report (SAR) submitted to the Nuclear Regulatory Commission (NRC), would these inspection and replacement determinations be constructed as showing evidence of a reduction in integrity which would require the packaging to be reconditioned in accordance with § 173.28(c)(2)?

A1. The answer to your question is no. Routine inspections and replacements of packaging components would not normally be considered to be evidence of a reduction in integrity which would require the packaging to be reconditioned in accordance with § 173.28(c)(2). As stated in § 173.28(a), the reconditioning requirements apply only to packages which have suffered damage which have reduced their structural integrity. Should an inspection reveal sufficient structural damage that reduces packaging integrity, then the reconditioning requirements would apply.

Q2. If containment is independent of the outer packaging (i.e. removable containment vessel with separate closure device including any required gaskets), would the determination of a reduction in integrity of a containment system component also require the reconditioning of the protective outer packaging? Or is it permitted to recondition the containment system and outer packaging independently?

A2. If it is determined that the reduction in packaging integrity is limited to the internal containment vessel and did not impact the outer packaging, reconditioning of the outer packaging would not be necessary.

Q3. The requirements of § 173.28(c)(2)(i) stipulate the removal of all former contents. What are the acceptable contamination limits that would satisfy this requirement? Would the packaging be decontaminated to; less than or equal to the contamination levels specified in § 173.403, ensuring that the activity concentration and the total activity are less than or equal to the limits specified in § 173.403, less than or equal to the non-fixed external contamination limits specified in § 173.443, or less than or equal to the internal contamination limits specified in § 173.428(d)?

A3. The requirement in § 173.28(c)(2)(i) simply states, removal of all former contents. Decontamination is not required by this paragraph. However, if the packaging is to be shipped to another location to be repaired, it would need to meet the requirements of § 173.443, or if shipped as "Empty", the requirements of § 173.428.

Q4. The requirements of § 173.28(c)(2)(i) stipulate cleaning to original materials of construction. What extent of packaging disassembly would be required for packaging with intermediate cavities to satisfy this cleaning requirement? Or does this requirement only apply to accessible surfaces?

A4. This requirement only applies to those surfaces which would come in contact with the contents and which would need cleaning to fully remove the contents.

Q5. For non-bulk Type B and Fissile Material packagings, what constitutes cushioning and cushioning material? Does the § 173.28(c)(2)(iii) requirement for replacement of all cushioning and cushioning material impose the replacement of all impact-limiting materials of construction? Are elastomeric pads or spacers, which are used to avoid metal-to-metal contact or to limit vibration, considered cushioning or cushioning material?

A5. Cushioning material is not a defined term in the HMR. Without specific package details this office cannot determine what internal components may or may not be considered cushioning material. Generally speaking, cushioning material in non-bulk packages refers to material that is not an integral component of the package that is added to absorb shocks normally incident to transportation. Generally, elastomeric pads or spacers used as spacers between integral metal components would not considered to be cushioning or cushioning material It is important to note that the requirement to replace cushioning and cushioning material only applies to packages deemed to have damage which reduces its structural integrity in accordance with § 173.28.

Q6. What markings applied by the reconditioner are required for non-bulk Type B and Fissile Material packagings?

A6. The requirement to mark reconditioned packaging in § 173.28(c)(3) is limited to a person who reconditions a packaging manufactured and marked under the provisions of subpart L of part 178 of the HMR. As Type B and Fissile Materials are not packages manufactured and marked under these provisions, no reconditioning mark is required.

Q7. Based on the PHMSA response in interpretation 11-0302, a domestic reconditioning activity would be imposed for non-bulk packagings that are internationally excluded from the reuse and reconditioning requirements specified in chapter 6.1 of the United Nations

Model Regulations. Are the PHMSA responses to Q1-Q6 different for packages authorized in accordance with §§ 173.415(d), 173.416(b), 173.417(a)(1)(iii), and 173.417(b)(2)?

A7. Packages offered in accordance with §§ 173.416(b), 173.417(a)(1)(iii), and 173.417(b)(2) are only authorized for export or import shipments and are contingent on the package fulfilling the requirements of both the foreign competent authority certificate and the U.S. Competent Authority revalidation, and all requirements of the certificates and revalidations must be met in accordance with § 171.23(b)(11)(ii). Packages offered in accordance with § 173.415(d) must conform with requirements of the country of origin and the International Atomic Energy Agency regulations applicable to Type A packagings. Our response to your previous interpretation request (11-0302), as well as this response, do not impose any requirements beyond repairing a damaged package as needed to meet the requirements applicable to it.

I trust this satisfies your inquiry. Please contact us if we can be of further assistance.

Sincerely,

Delmer Billings
Senior Regulatory Advisor
Standards and Rulemaking Division

Webb
§ 173.28
Reuse
13-0047

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ADDITIONAL CLARIFICATION OF PACKAGING REUSE AND RECONDITIONING REQUIREMENTS

Given the the U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA) response (Reference No.: 11-0302, dated April 2, 2012) to our previous request for clarification (NRE-PE-11-0133, dated Nov. 2, 2011), we request additional clarification of the 49 CFR 173.28 provisions applicable to Type B and fissile material packagings, which: (1) are intended for reuse; (2) are considered non-bulk packagings as defined in 49 CFR 171.8; and (3) meet the applicable requirements of 49 CFR 173, Subpart I, and have been evaluated, approved, and certified for use in accordance with 10 CFR Part 71. As described, the subject packagings of this inquiry are authorized in accordance with the requirements of 49 CFR 173.416(a), 49 CFR 173.417(a)(1)(ii), and 49 CFR 173.417(b)(1) as well as Type B and fissile material packagings evaluated, approved, and certified by the U.S. Department of Energy in accordance with 49 CFR 173.7(d).

Background

As stated in 49 CFR 172.101(i), "When packaging requirements are specified, they are in addition to the standard requirements for all packagings prescribed in § 173.24 of this subchapter and any other applicable requirements in subparts A and B of part 173 of this subchapter." The general design requirements in 49 CFR 173.410 establish that "In addition to the requirements of subparts A and B of this part, each package used for the shipment of Class 7 (radioactive) materials must be designed so that—..." Furthermore, it is recognized that as specified in 49 CFR 173.401(a) the requirements in 49 CFR 173, Subpart I, are in addition to, not in place of, other requirements set forth in 49 CFR, Subchapter C, for Class 7 (radioactive) materials and those of the U.S. Nuclear Regulatory Commission (NRC) delineated in 10 CFR 71.

Title 10 CFR 71.0(b) states that the requirements of 10 CFR 71 are in addition to, and not in substitution for, other requirements. Also, 10 CFR 71.5 requires that the transportation of licensed material shall comply with the applicable requirements of the U.S. Department of Transportation regulations in 49 CFR parts 107, 171–180, and 390–397, appropriate to the mode of transport. Accordingly, the design, fabrication, assembly, testing, maintenance, repair, modification, and use of the subject packagings is governed by the applicable NRC; DOT; and other Federal, State, and local regulations not preempted by the DOT.

With respect to the subject packagings, an application for package approval is prepared in accordance with the requirements of 10 CFR 71, Subpart D. NRC Regulatory Guide 7.9, *Standard Format and Content of Part 71 Applications for Approval of Packages for Radioactive Material* provides guidance on preparing the application for approval of Type B and fissile material transportation packages. The application [hereafter referred to as a safety analysis report (SAR)] is the principal document in which an applicant provides the information and bases for the NRC staff to use in determining whether a given package meets the requirements of 10 CFR Part 71. Safety analysis reports that are prepared in accordance with the standard format presented in NRC Regulatory Guide 7.9 will have sections, which establish the fundamental requirements for the package operations as well as the acceptance tests and maintenance program. Additionally, as specified in 10 CFR 71.37, the applicant shall describe the quality assurance (QA) program for the design, fabrication, assembly, testing, maintenance, repair, modification, and use of the proposed package.

Package operations, consistent with the package evaluation in the SAR, are routinely performed in accordance with detailed, written site-specific procedures based on the Certificate of Compliance (CoC), the package operations section of the SAR, and facility-specific operational requirements. Acceptance tests and maintenance program activities are performed in accordance with the SAR provisions to ensure that the design requirements and the conditions of approval in the CoC are satisfied in addition to ensuring the integrity of the packaging components with respect to the structural, thermal, containment, shielding, and criticality evaluations in the SAR. Furthermore, the subject packagings are fabricated, procured, and maintained according to an approved QA program in accordance with 10 CFR 71, Subpart H. As stated in 10 CFR 71.101(a), this established QA program describes the quality assurance requirements that apply to the design, purchase, fabrication, handling, shipping, storing, cleaning, assembly, inspection, testing, operation, maintenance, repair, and modification of packaging components that are important to safety.

Guidance on the Determination of a Reduction in Integrity

For the subject packagings, routine inspections are performed to ensure that the packaging is in unimpaired physical condition, except for superficial defects, in accordance with 49 CFR 173.475(b) and 10 CFR 71.87(b) as well as required inspections to ensure that each closure device of the packaging, including any required gasket, is properly installed, secured, and free of defects in accordance with 49 CFR 173.475(c) and 10 CFR 71.87(c). As required in

10 CFR 71.91, records for the subject packagings are maintained, which verify: (1) that there are no significant defects in the packaging, as shipped; (2) the results of the quality control provisions in 49 CFR 173.475 and routine determinations in 10 CFR 71.87; and (3) the conditions of the package approval. Reporting requirements for the subject packagings are specified in 10 CFR 71.95, which include: (1) instances in which there is a significant reduction in the effectiveness of the subject packagings during use; or (2) details of any defects with safety significance in any of the subject packagings, after first use.

The package operations chapter of the SAR often permits incidental maintenance activities including provisions for the routine replacement of damaged packaging components with certified replacements during package loading, package unloading, and preparation of the empty package for transport. In addition, the maintenance program often specifies routine inspections with replacement requirements for deteriorated or damaged packaging components in accordance with the SAR and as supplemented by the conditions of approval in the CoC. Title 49 CFR 173.28(b)(1) states:

> **(b) *Reuse of non-bulk packaging.* A non-bulk packaging used more than once must conform to the following provisions and limitations:**
>
> **(1) A non-bulk packaging which, upon inspection, shows evidence of a reduction in integrity may not be reused unless it is reconditioned in accordance with paragraph (c) of this section.**

Q1: If packaging components are inspected and determined to require replacement in accordance with established acceptance criteria in the SAR, would these inspection and replacement determinations be construed as showing "evidence of a reduction in integrity," which would require the packaging to be reconditioned in accordance with 49 CFR 173.28(c)(2)?

The subject non-bulk packagings often incorporate design features for lifting, tie-down, impact limiting, thermal insulation, heat dissipation, radiation shielding, nuclear criticality safety, and containment. The containment system may be integral to the packaging or it may be a separate container that is enclosed within a protective outer packaging, which may be fabricated with intermediate cavities filled with impact-limiting, thermal-insulating, neutron-absorbing, or shielding materials and other engineering features. For packagings with an integral containment boundary, which upon inspection shows evidence of a reduction in integrity, it seems apparent that based on the DOT PHMSA response (Reference No.: 11-0302) the packaging as a whole would be subject to the reconditioning requirements in 49 CFR 173.28(c)(2).

Q2: If containment is independent of the outer packaging [i.e., removable containment vessel with separate closure device including any required gasket(s)], would the determination of a reduction in integrity of a containment system component also require the reconditioning of the protective outer packaging? Or, is it permitted to recondition the containment system and outer packaging independently?

Reconditioning of Non-Bulk Type B and Fissile Material Packagings

As required in 49 CFR 173.28(b), a non-bulk packaging, which upon inspection shows evidence of a reduction in integrity may not be reused unless it is reconditioned in accordance with 49 CFR 173.28(c). For the subject packagings, the applicable reconditioning requirements are specified in 49 CFR173.28(c)(2), which states:

> **(2) For the purpose of this subchapter, reconditioning of a non-bulk packaging other than a metal drum includes:**
>
> **(i) Removal of all former contents, external coatings and labels, and cleaning to the original materials of construction;**
>
> **(ii) Inspection after cleaning with rejection of packagings with visible damage such as tears, creases or cracks, or damaged threads or closures, or other significant defects;**
>
> **(iii) Replacement of all non-integral gaskets and closure devices with new or refurbished parts, and cushioning and cushioning materials; and components including gaskets, closure devices and cushioning and cushioning material. (For a UN 1H1 plastic drum, replacing a removable gasket or closure device with another of the same design and material that provides equivalent performance does not constitute reconditioning); and**
>
> **(iv) Ensuring that the packagings are restored to a condition that conforms in all respects with the prescribed requirements of this subchapter.**

Q3: The requirements of 49 CFR 173.28(c)(2)(i) stipulate the "removal of all former contents." What are the acceptable contamination limits that would satisfy this requirement? Would the packaging be decontaminated to:

(1) less than or equal to the contamination levels (fixed plus removable) specified in 49 CFR 173.403 (*Contamination*);

(2) ensure that the activity concentration and the total activity are less than or equal to the limits specified in 49 CFR 173.403 (*Radioactive material*);

(3) less than or equal to the non-fixed external contamination limits specified in 49 CFR 173.443; or

(4) less than or equal to the internal contamination limits specified in 49 CFR 173.428(d)?

As stated earlier, the containment system for non-bulk Type B and Fissile Material packagings may be integral to the packaging or it may be a separate container that is enclosed within a protective outer packaging with intermediate cavities filled with impact-limiting, thermal-insulating, neutron-absorbing, or shielding materials. While the requirements of 49 CFR173.28(c)(2) are directly applicable to single-walled non-bulk packagings (other than a metal drum), without further clarification or guidance these requirements are not readily extrapolated to the engineered features common to the subject non-bulk packagings.

Q4: The requirements of 49 CFR 173.28(c)(2)(i) stipulate "cleaning to the original materials of construction." What extent of packaging disassembly would be required for packagings with intermediate cavities to satisfy this cleaning requirement? Or, does this requirement only apply to accessible surfaces?

Q5: For non-bulk Type B and Fissile Material packagings, what constitutes cushioning and cushioning material? Does the 49 CFR173.28(c)(2)(iii) requirement for replacement of all cushioning and cushioning material impose the replacement of all impact-limiting materials of construction? Are elastomeric pads or spacers, which are used to avoid metal-to-metal contact or to limit vibration, considered cushioning or cushioning material?

Markings Applied by the Reconditioner

Since the subject packagings are not manufactured and marked under the provisions of 49 CFR 178, Subpart L—Non-bulk Performance-Oriented Packaging Standards, the first sentence of 49 CFR 173.28(c)(3) is not applicable. However, for the subject packagings that are reconditioned in accordance with 49 CFR 173.28(c)(2), marking requirements are imposed by 49 CFR 173.28(c)(4) and the second sentence of 49 CFR 173.28(c)(3). Title 49 CFR 173.28(c)(3) and (4) state that:

> **(3) A person who reconditions a packaging manufactured and marked under the provisions of subpart L of part 178 of this subchapter, shall mark that packaging as required by § 178.503(c) and (d) of this subchapter. The marking is the certification of the reconditioner that the packaging conforms to the standard for which it is marked and that all functions performed by the reconditioner which are prescribed by this subchapter have been performed in compliance with this subchapter.**
>
> **(4) The markings applied by the reconditioner may be different from those applied by the manufacturer at the time of original manufacture, but may not identify a greater performance capability than that for which the original design type had been tested (for example, the reconditioner may mark a drum which was originally marked as 1A1/Y1.8 as 1A1/Y1.2 or 1A1/Z2.0).**

Q6: What "markings applied by the reconditioner" are required for non-bulk Type B and Fissile Material packagings?

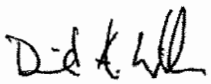
Reconditioning of Other Non-Bulk Type B and Fissile Material Packagings

While this request for clarification is limited to the applicability of 49 CFR 173.28 with respect to the specified subset of Class 7 (radioactive) material packages, we recognize that full consideration to the broader universe of packagings, which are subject to the requirements of 49 CFR 173, Subpart I, may be warranted. For example, non-bulk packages authorized in accordance with 49 CFR 173.415(d), 49 CFR 173.416(b), 49 CFR 173.417(a)(1)(iii), and 49 CFR 173.417(b)(2), which meet the applicable requirements of the International Atomic Energy Agency (IAEA), *Regulations for the Safe Transport of Radioactive Material*, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised), are excluded from international reconditioning activities as acknowledged in Chapter 6.1, "Requirements for the Construction and Testing of Packages" of the United Nations (UN) *Recommendations on the Transport of Dangerous Goods, Model Regulations*, sixteenth revised edition, Volumes I and II (2009). Although Chapter 6.1 of the UN Model Regulations includes requirements for reconditioning packagings, as stated in 6.1.1.1, these requirements do not apply to packages containing radioactive material that comply with the regulations of the IAEA.

Q7: Based on the DOT PHMSA response (Reference No.: 11-0302), a domestic reconditioning activity would be imposed for non-bulk packagings that are internationally excluded from the reuse and reconditioning requirements specified in Chapter 6.1 of the UN Model Regulations. Are the DOT responses to **Q1**–**Q6** different for packages authorized in accordance with 49 CFR 173.415(d), 49 CFR 173.416(b), 49 CFR 173.417(a)(1)(iii), and 49 CFR 173.417(b)(2)?

If you have any questions or need additional information, please feel free to contact me.

Respectively submitted,



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c: M. D. Waters, NRC/NMSS/SFST
Navarro Project File

U.S. Department
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APR 0 2 2012

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Reference No.: 11-0302

Dear Mr. Wilson:

This is in response to your November 17, 2011 letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) as they pertain to the reuse and reconditioning provisions of § 173.28. Specifically you ask if the reuse and reconditioning provisions of § 173.28 are applicable to Type B(U), Type B(M), and fissile material packagings.

The answer to your question is yes. Subpart I of part 173 describes the shippers general requirements for Class 7 (radioactive) materials. General design requirements are discussed in § 173.410. The introductory text to § 173.410 states that each package used for the shipment of Class 7 materials must be designed to the requirements of this section, as well as meet the requirements of subparts A and B of this part. The section you reference, § 173.28 is found in subpart B of part 173, and thus the reuse and reconditioning provisions found in § 173.28 apply to shipments of Type B(U), Type B(M), or fissile packagings.

I hope this satisfies your inquiry. Please contact us if we can be of further assistance.

Sincerely,

Delmer Billings
Senior Regulatory Advisor
Standards and Rulemaking Division

Webb
§173.28
Reuse
11-0302

NRE-PE-11-0133
November 17, 2011

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CLARIFICATION OF PACKAGING REUSE AND RECONDITIONING REQUIREMENTS

In support of transportation related activities associated with Class 7 (radioactive) materials under the Hazardous Materials Regulations (49 CFR Parts 171–180), we request clarification of the reuse and reconditioning provisions of 49 CFR 173.28 applicable to Type B(U), Type B(M), and fissile material packagings, which meet the applicable requirements of 49 CFR, Subpart I and have been evaluated, approved, and certified for use in accordance with 10 CFR Part 71. More specifically, to what extent, if any, are the requirements of 49 CFR 173.28 applicable to Type B(U), Type B(M), and fissile material packagings?

If you have any questions or need additional information, please feel free to contact me. Thank you for your assistance.

Respectively submitted,

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c: Navarro Project File