U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

JUN - 6 2008

Ms. Ella McNeil, Acting Director
Office of Packaging and Transportation
Office of Safety and Operations
Office of Environmental Management
U. S. Department of Energy
Washington, DC 20585

Ref. No.: 08-0055

Dear Ms. McNeil:

This responds to your letter dated March 5, 2008, requesting clarification regarding the use of freight containers which are designed, tested, and fabricated to ISO 1496-1: "Series 1 Freight Containers – Specifications and Testing – Part 1: General Cargo Containers," as Industrial packagings (IP) Type 1 (IP-1), Type 2 (IP-2) and Type 3 (IP-3) containers under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you request clarification on whether an offeror must comply with the use and documentation requirements of § 173.411(b)(6) and (c) of the HMR.

According to your letter, Department of Energy (DOE) utilizes freight containers for shipments of low-level radioactive materials destined for disposal. Many times the containers are transported to the disposal sites and buried with the radioactive contents. In accordance with the HMR, these freight containers can be used as IP-1, IP-2, and IP-3. The majority of these containers are designed and fabricated overseas. All of the designs and associated testing, analysis, and fabrication activities are independently reviewed and approved by competent authorities or designated authorized approval agencies (e.g., American Bureau of Shipping, Bureau Veritas, or Germanischer Lloyd). Much of the information required by § 173.411(c), is considered proprietary or confidential and is located in foreign countries. Thus, it is difficult, if not impossible, for an offeror to obtain the complete documentation that may be required.

Your questions are answered as follows:

Question 1:

Would an offeror be required to demonstrate that the requirements of § 173.410(b) have been met even though the freight container has passed all the required tests in ISO 1496-1?

Answer 1:

The answer is yes. An offeror would be required to demonstrate that the requirements of § 173.410(b) have been met, even though a freight container has passed all the required tests in ISO 1496-1. Section 173.411(b)(6)(ii) requires freight containers used as IP–2 or IP–3 to satisfy the requirements for an IP–1 as specified in § 173.411(b)(1). Section 173.411(b)(1) requires each IP–1 to meet the general design requirements prescribed in § 173.410. Section 173.410(b) requires each operable lifting attachment that is a structural part of the package to be designed with a minimum safety factor of three against yielding when used to lift the package in the intended manner. ISO 1496-1 and ISO 1161: "Series 1 freight containers – Corner fittings – Specification" do not specify such a design requirement, therefore the minimum safety factor of three against yielding for each operable lifting attachment is an additional HMR requirement for freight containers designed in accordance with ISO 1496-1 and ISO 1161. Alternatively, as prescribed in § 173.410(b), any other structural part of the package must be capable of being rendered inoperable for lifting the package during transport or must be designed with strength equivalent to that required for lifting attachments.

Question 2:

Is documented evidence, (e.g., production certificate), from an approved third party organization acceptable justification for DOT that a freight container is in compliance with ISO 1496-1, when this documented evidence verifies the freight container design has been tested to the same testing criteria found in the ISO 1496-1 standard?

Answer 2:

The answer is no. Documented evidence (e.g., a production certificate) from a third party organization does not provide acceptable justification that a freight container complies with ISO 1496-1, unless it provides complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with the standard. In accordance with § 173.411(c), except for IP–1 packagings, each offeror of an industrial package must maintain on file for at least one year after the latest shipment, and shall provide to the Associate Administrator for Hazardous Materials Safety upon request, complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that Standard. Freight containers designed to conform to ISO 1496-1, excluding dimensions and ratings, are permitted as a partial alternative to the tests required for IP-2 and IP-3 packages in § 173.411. In accordance with § 173.411(b)(6)(iii), the containers must conform to the standards prescribed in ISO 1496-1 and must also be designed such that if subjected to the tests prescribed in ISO 1496-1 and the accelerations occurring during routine conditions of transport they would prevent: (a) Loss or dispersal of the radioactive contents; and (b) Loss of shielding integrity which would result in more than a 20% increase in the radiation level at any external surface of the freight containers. It should be noted that the test conditions of accelerations occurring during routine conditions of transport are in addition to the testing prescribed by ISO 1496-1, because the ISO Standard does not include dynamic tests.

Therefore, in addition to conforming to the ISO 1496-1 design standards, complete documentation is required in accordance with § 173.411(c). Complete documentation is also required demonstrating that the freight containers are designed such that if subjected to the tests prescribed in the Standard and the accelerations occurring during routine conditions of transport (given the particular radioactive contents) the following will be prevented: a) Loss or dispersal of the radioactive contents, and b) Loss of shielding integrity which would result in more than a 20% increase in the radiation level at any external surface of the freight container.

I hope this answers your inquiry.

Sincerely,

Edward T. Mazzullo

Edward T. Mazzullo
Director
Office of Hazardous Materials Standards

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§ 173.411 (b)(6)
Industrial Packagings
08-0055

Department of Energy
Washington, DC 20585

MAR 05 2008

Mr. Edward Mazzullo
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Subject: Clarification on the Use of Freight Containers per 49 CFR 173.411(b)(6)

Dear Mr. Mazzullo:

This letter is to request clarification of the Department of Transportation (DOT) requirements for using freight containers, which are designed, tested, and fabricated to the ISO 1496-1 Standard, as Industrial Packagings Type 2 and 3. Specifically, we are requesting clarification as to the DOT expectations of an offeror to comply with the current regulations relative to the use and documentation required by 49 CFR 173.411(b)(6) and 49 CFR 173.411(c).

The Department of Energy (DOE) utilizes freight containers for shipments of low-level radioactive materials destined for disposal. Many times the containers are transported to the disposal sites and buried with the radioactive contents. In accordance with DOT regulations, these freight containers can be used as Industrial Packaging Types 1, 2, and 3 (IP-1, IP-2, and IP-3). As you are aware, the vast majority of these containers are designed and fabricated overseas. All of the designs and the associated testing, analysis, and fabrication activities are independently reviewed and approved by competent authorities or designated authorized approval agencies (e.g., American Bureau of Shipping, Bureau Veritas, or Germanischer Lloyd). Much of the information required by the regulations, especially by 49 CFR 173.411(c), is considered proprietary or confidential and is located in foreign countries. Thus, it is difficult, if not impossible, for an offeror to obtain complete documentation that may to be required.

To understand specifically what DOT expects of offerors, please provide clarification for the following questions. DOE is providing comments immediately following each question and additional information supporting each comment in the Enclosure for your reference.

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Question 1:

To meet the requirements of 173.411(b) (6), freight containers must comply with the requirements of IP-1 containers including 173.410(b). 173.410(b) requires that each lifting attachment be designed with a minimum safety factor of three against yielding. Knowing that a freight container's corner fittings are designed and constructed to meet the ISO 1161 Standard, will an offeror be required to demonstrate that 173.410(b) is met even though the freight container has passed all the required tests in ISO 1496-1?

DOE considers the performance history of these containers as proof that when operated within the design envelop this requirement is satisfied. The standard is designed so that top and bottom corners will provide compatibility in the interchange between transportation modes with the loads that meet the ISO 1161 Standard.

Question 2:

49 CFR 173.411 (b) (3) allows freight containers designed to conform to the ISO 1496-1 Standard be used as IP-1, IP-2 and IP-3 containers for shipment of radioactive material. Is documented evidence (e.g., production certificate) from an approved third party organization acceptable justification for DOT that a freight container is in compliance with the ISO standard, when this documented evidence verifies the freight container design has been tested to the same testing criteria found in the standard?

DOE considers that documented evidence from an approved third party organization is acceptable to prove a freight container meets the ISO 1496-1 Standard as required by 49 CFR173.411 (b)(3).

Your clarification of these issues would be greatly appreciated by the Department. If you need additional information, please contact me at (202) 586-8548, or Mr. Ashok Kapoor of my staff at (202) 586-8307.

Sincerely,

Ella Mc Neil, Acting Director
Office of Packaging and Transportation
Office of Safety Management
and Operations
Office of Environmental Management

Enclosure

cc : D. Chung, EM-60
A. Kapoor, EM-63

Enclosure

The following documentation represents background information for each question submitted. The documentation is based on research performed by, and experiences of, DOE contractors.

Question 1:
When a freight container is designed and tested to ISO1496-1 there are a number of other ISO standards incorporated by reference. One of these standards is ISO 1161, Series 1 Freight Containers – Corner Fittings – Specifications. This Standard was developed by technical and operational personnel drawing from all phases of the transportation industry. The standard is designed so that top and bottom corners will provide compatibility in the interchange between transportation modes. This ISO standard identifies the strength requirements that top and bottom corner fittings will be designed and constructed to and in such a manner and of such materials as to enable them to pass the operating and testing requirements laid down in ISO 1496-1 (Section 4, ISO 1161). From this we see that when a freight container is designed and tested to the ISO 1496-1 requirements, the lifting attachments, i.e. top and bottom corner fittings and fork lift pockets, will operate and function properly when handled within the design envelop. DOE believes the performance history of these containers prove that when operated within the design envelop this requirement is met. In support of this the IAEA Safety Guide TS-G-1.1, Para. 627.1, states that "Freight containers designed and tested to ISO 1496-1 and approved in accordance with the CSC Convention have been proved, by the use of millions of units, to provide safe handling and transport under routine conditions of transport." This should be considered sufficient information for an offeror to show that this requirement is already met.

If DOT requires that this requirement be demonstrated it has the potential of reducing the operating design envelop of the freight container. Also if DOE chooses to use the container at its design envelop it may require DOE to have the containers designed and tested to parameters exceeding the ISO 1496-1 standard. This additional design and testing would cost the offeror thousands of dollars for this effort and if they choose to use the freight container at it's reduce design envelop would add an additional burden of using more containers than required.

Question 2:

All of the designs and the associated testing, analysis, and fabrication activities are independently reviewed and approved by competent authorities or a designated an approved third party organization (e.g., ABS, Bureau Veritas, or Germanischer Lloyd). These qualified organizations review and approve the various freight container designs at a minimum to the International Convention for Safe Containers (CSC) criteria. Many, if not most, approval agencies, require the criteria in the ISO 1496-1 Standard to be met in addition to the CSC criteria. When the CSC plate is affixed to a freight container it certifies the approval of the design, testing, and fabrication results by the competent

authorities or designated third party organization. These results are documented in the approval agency production certificates, test certificates, and container test reports. This third party approval process can be compared to the review, approval, and certification that Type B packages undergo. The ability to obtain these documents from an approval agency depends on the approval agency itself and its willingness to research and supply these documents to an end user. It also may depend upon the age of the freight container as the older the container the more difficult the process will be for obtaining documentation. An offeror has a better chance of obtaining these documents if they request the documents at the time the containers are initially procured. To date, DOE contractors do not procure freight containers certified by a specific approval agency (e.g., ABS) because of the risk of delaying procurement. Additionally, many approval agencies will not consider providing any documentation without the consent of the manufacturer, who most likely has no contractual relationship with the offeror unless; however a significantly large quantity of containers is being procured. DOE contractors usually procure from 1 to 10 containers at one time. Lastly, the value of obtaining detailed testing documentation (e.g., container test reports) is of no practical value to the offeror since the ISO-1496-1 Standard test conditions are not directly comparable to the impact on radioactive contents.