U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

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

MAY 18 2005

Mr. Mark Hawk
Oak Ridge National Laboratory
National Transportation Research Center, Rm. A14
2360 Cherahala Blvd
Knoxville, TN 37932

Ref No.: 05-0093

Dear Mr. Hawk:

This responds to your June 4, 2004 letter and previous email correspondence with Jim Williams, Health Physicist, Office of Hazardous Materials Technology (DHM-20) requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask for assistance in determining when the drop test specified in § 173.465(c) and the hypothetical accident condition test specified in § 173.467 are required for packages intended for Type A quantities of fissile, radioactive material (RAM). You request clarification of the regulations in effect prior to the final rule published on January 26th, 2004 under Docket No. RSPA–99–6283 (HM–230), which became effective October 1, 2004. In your letter, you incorporated a list of conclusions that were based on your understanding of the testing requirements in §§ 173.465(c) and 173.467 as they apply to fissile material packages authorized for use by § 173.417(a). The list of conclusions you provided in your letter has been summarized and revised below to accurately reflect the requirements of the HMR in effect prior to October 1, 2004:

- **49 CFR 173.417(a)(1) – For a DOT Specification 6L:**
  The free drop test specified in § 173.465(c) does not apply.

- **49 CFR 173.417(a)(2) – For a DOT Specification 6M:**
  The free drop test specified in § 173.465(c) does not apply.

- **49 CFR 173.417(a)(3) – For any packaging listed in 49 CFR 173.415, limited to the Class 7 (radioactive) materials specified in 10 CFR part 71, Subpart C:**
  The free drop test specified in § 173.465(c) does apply, and the package must meet the initial drop test requirements for fissile material specified in § 173.465(c)(2).

- **49 CFR 173.417(a)(4) – For any other Type A or Type B, Type B(U), or Type B(M) packaging for fissile Class 7 (radioactive) materials that also meets the applicable standards for fissile materials in 10 CFR Part 71:**
  The free drop test specified in § 173.465(c) does not apply because these packagings are subject to the tests prescribed in 10 CFR Part 71.

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173.465(c)(2)
173.467

- **49 CFR 173.417(a)(5) - For any other Type A or Type B, Type B(U), or Type B(M) packaging that are foreign made and for which the US Competent Authority has revalidated the foreign competent authority certificate:**
  The free drop test specified in § 173.465(c) does not apply. However, these packagings must comply with the requirements of the country of origin and applicable requirements of the International Atomic Energy Agency "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6," (incorporated by reference, *see* § 171.7).

- **49 CFR 173.417(a)(6) – For a 55-gallon 1A2 steel drum, meeting the applicable packaging testing requirements of Part 178, Subpart M at the packing group I performance level; and meeting the eight (8) conditions of § 173.417(a)(6), including 49 CFR 173.417(a)(6)(v) that requires an appropriate primary, inner containment meeting the Type A provisions of 49 CFR 178.350:**
  The Type A inner packaging must satisfy the requirements of the free drop test specified in § 173.465(c) and the initial drop test requirements for fissile material specified in § 173.465(c)(2).

Section 173.467 requires packaging for fissile material to meet the hypothetical accident condition test requirements prescribed by the Nuclear Regulatory Commission (NRC) in 10 CFR part 71. The applicability of the hypothetical accident condition test to the packagings listed above must be determined in accordance with 10 CFR part 71. Requests for guidance on 10 CFR part 71 should be addressed to the NRC.

Note that, the DOT specification 6L, 6M and 1A2 packagings referenced in this letter are only authorized to be used for fissile material through October 1, 2008 (§ 173.417).

Also, in your letter you state that §§ 173.465(c)(3) and (c)(4) allow the use of separate specimens for the corner drop test. That statement is incorrect. The regulations actually require that you "must" use separate specimens for the corner drop test specified in §§ 173.465(c)(3) and (c)(4).

I hope this information is helpful. Please contact us if you require additional assistance.

Sincerely,

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

Williams, James <PHMSA>

From: Hawk, Mark B. [hawkmb@ornl.gov]
Sent: Thursday, April 14, 2005 4:16 PM
To: Williams, James <PHMSA>
Subject: FW: Fissile Drop Testing for Type A Quantities of RAM

Eichenlaub
§173.465(c)(2)
§173.467
Testing
05-0093

-----Original Message-----
From: Hawk, Mark B.
Sent: Friday, June 04, 2004 8:51 AM
To: 'james.william@rspa.dot.gov'
Subject: FW: Fissile Drop Testing for Type A Quantities of RAM

Jim:

Thanks for your assistance in determining when the fissile drop testing of 49 CFR 173.465(c)(2) is required for Type A quantities of fissile, radioactive material (RAM), and the difference between the NRC requirements and DOT requirements. Below is my summary of our discussions concerning this matter. Please let me know if there are any inaccuracies in my summary.

Originally I contacted you to determine when the DOT 49 CFR 173.465(c)(2) fissile drop testing is required for packagings with Type A quantities of fissile RAM. During our discussions, it appeared that the NRC requirement per 10 CFR 71.71(c)(8), called a *"Corner drop"*, is not consistent with the DOT Type A packaging tests described in 49 CFR 173.465(c)(2). You contacted NRC to determine their opinion. The results of your discussion with NRC concluded that the DOT 49CFR173.465(c)(2) fissile drop testing is a precondition test that is performed prior to the normal free drop test of 49 CFR 173.465(c)(1). The 10 CFR 71.71(c)(8) *"Corner drop"* is one of the normal condition tests of 10 CFR 71.71(c) *"Conditions and tests"* and the sequencing of this test is not addressed.

In addition, the NRC 10 CFR 71.71(c)(8) *"Corner drop"* is limited to, or only applies to, specific fiberboard, wood, or fissile material rectangular packages not exceeding 50 kg (110 lbs.), and fiberboard, wood, or fissile material cylindrical packages not exceeding 100 kg (220 lbs). Where as, the DOT 49 CFR 173.465(c)(2) test applies to all fissile packages (i.e., 55-gallon, steel drums). DOT 49 CFR 173.465(c)(3) and (4) does allow for separate specimens (other than those going through the full Type A packaging tests) to be used per for fiberboard or wood rectangular packages with a mass of 50 kg (110 lbs.) or less, or cylindrical fiberboard packages with a mass of 100 kg (220 lbs) or less.

In determining when the DOT 49 CFR 173.465(c)(2) fissile drop testing is required versus the NRC 10 CFR 71.71 (c)(8) *"Corner drop"*, we can use the list of "Authorized fissile materials packages" for Type A quantities of fissile materials per DOT 49 CFR 173.417(a). It is my understanding that the following is appropriate as addressed in the current regulations (not HM-230):

- 49 CFR 173.417(a)(1) – For a DOT Specification 6L – neither test is applicable as the DOT Specification 6L can be used "as is" for Type A quantifies of fissile RAM
- 49 CFR 173.417(a)(2) - For a DOT Specification 6M – neither test is applicable as the DOT Specification 6M can be used "as is" for Type A quantifies of fissile RAM
- 49 CFR 173.417(a)(3) – For any packaging listed in 49 CFR 173.415, limited to the Class 7 (radioactive) materials specified in 10 CFR part 71, Subpart C, the DOT 49 CFR 173.465(c)(2) fissile drops apply as these are packages to be used under an NRC general license and are not subject to the packaging approval process and package testing requirements of 10 CFR71 Subparts E and F, respectively. (No hypothetical accident tests need to be performed.)
- 49 CFR 173.417(a)(4) – For any other Type A or Type B, Type B(U), or Type B(M) packaging for fissile Class 7 (radioactive) materials that also meets the applicable standards for fissile materials in 10 CFR Part

71, the NRC 10 CFR 71.71(c)(8) "*Corner drop*" would apply as these packages are subject to the packaging approval process and package testing requirements of 10 CFR 71 Subparts E and F, respectively. (Both the normal condition and hypothetical tests need to be performed.)

- 49 CFR 173.417(a)(5) - For any other Type A or Type B, Type B(U), or Type B(M) packaging that are foreign made and for which the US Competent Authority has revalidated the foreign competent authority certificate, neither DOT or NRC test is applicable.
- 49 CFR 173.417(a)(6) – For a 55-gallon 1A2 steel drum meeting the eight (8) provisions of this section, including 49 CFR 173.417(a)(6)(v) that requires an appropriate primary, inner containment meeting the Type A provisions of 49 CFR 178.350, the DOT 49 CFR 173.465(c)(2) fissile drops apply only to the inner Type A packages. (No hypothetical accident tests need to be performed.)

I appreciate your persistence in obtaining this information. If any corrections to the above need to be made, please advise accordingly.

Sincerely!

Mark Hawk
Oak Ridge National Laboratory
Phone: 865-946-1275
Fax: 865-946-1279