



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

AUG 1 2 2019

Mr. W. A. Winters
379 Aragon Avenue
Los Alamos, NM 87547

Reference No. 19-0034

Dear Mr. Winters:

This letter is in response to your March 21, 2019, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the transportation of radioactive materials. We have paraphrased and answered your questions as follows:

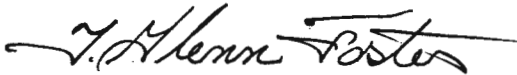
- Q1. In your letter, you describe a scenario in which the dose rate instrument used for beta/gamma is taken with an instrument that has a typical minimum sensitivity of 0.1 millirem/hour (mrem/h) gamma. You also note that there are several neutron reading instruments used with a typical minimum sensitivity of 0.25 mrem/h. You state that "Package A" contains a radionuclide(s) that emit both gamma and neutron radiation, and that the HMR requires both a gamma and neutron dose rate reading to be taken at the surface and one meter from the package. If the dose rate is not detectable above the instruments minimum sensitivity at either location, you ask whether it is acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation (0.1 mrem/h gamma + 0.25 mrem/h neutron = 0.25) and categorize "Package A" with the Class 7 label (i.e., Yellow II).
- A1. The answer is no. It would not be acceptable to assign the dose rate as the minimum detectable of the instrument for gamma and neutron radiation. Furthermore, the instrument should be capable of detecting 0.05 mrem/h to determine whether the transport index should be greater than zero (see A5 below).
- Q2. You state that "Package B" contains a gamma emitting nuclide(s) only, and that the HMR requires both a gamma and neutron dose rate reading be taken at the surface and one meter from the package. If the dose rate is not detectable above the instrument's minimum sensitivity at either location, you ask whether it is acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation (0.1 mrem/h gamma + 0.25 mrem/h neutron = 0.35) and categorize "Package B" with the Class 7 label (i.e., Yellow II).

- A2. The answer is no. It would not be acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation. In this case, since it is known that there is only a gamma emitting nuclide, it would be inappropriate to assign the minimum detectable neutron reading to the dose rate. Furthermore, the instrument should be capable of detecting 0.05 mrem/h to determine whether the transport index should be greater than zero (see A5 below).
- Q3. You state that "Package C" contains a beta-emitting nuclide only, and that the HMR requires both a gamma and neutron dose rate reading be taken at the surface and one meter from the package. If the dose rate is not detectable above the instrument's minimum sensitivity at either location, you ask whether it is acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation (0.1 mrem/h gamma + 0.25 mrem/h neutron = 0.35) and categorize "Package C" with the Class 7 label (i.e., Yellow II).
- A3. The answer is no. It would not be acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation. In this case, since it is known that there is only a beta-emitting nuclide, it would be inappropriate to assign the minimum detectable gamma and neutron readings to the dose rate. Furthermore, the instrument should be capable of detecting 0.05 mrem/h to determine whether the transport index should be greater than zero (see A5 below).
- Q4. You ask whether it is acceptable to be conservative and assign a higher category of Class 7 label to a package than that indicated by the dose rate instruments (i.e., Category Yellow II) rather than White I.
- A4. The answer is no. Assignment of a higher label category than indicated by dose rate measurements would be inappropriate.
- Q5. You ask whether it is required for the Class 7 label category determination that the person determining the dose rates uses a dose rate instrument and measurement times capable of achieving the minimum dose rate stated for Class 7 label categorization, specifically, 0.05 mrem/h (total combined gamma and neutron when neutron emitters are present).
- A5. The answer is no. The HMR does not specifically state that an instrument must be used or be capable of achieving a minimum dose rate of 0.005 mrem/hr. However, under § 173.22 of the HMR it is the shipper's responsibility to properly classify a hazardous material. It is recommended that for Class 7 label category determination that the person determining the dose rates for the Class 7 label categorization use a dose rate instrument and measurement times capable of detecting the minimum dose rate stated for Class 7 label categorization (per 49 CFR 172.403), specifically, 0.05 mrem/h.

- Q6. You ask whether it is acceptable to use scientific calculations to determine the dose rate at one meter rather than performing actual instrument dose rate measurements.
- A6. The answer is yes. However, under § 173.22 of the HMR it is the shipper's responsibility to properly classify a hazardous material. While calculations may give an indication of the expected levels, confirmation from actual readings is recommended to assure that the package is properly loaded, assembled, closed and prepared for transportation.
- Q7. You ask whether it will be a violation of the HMR if a corporate policy requires minimum instrument sensitivity be assigned as the dose rate of a package and the Class 7 label category determined from this regardless of the actual dose rates and nuclides present.
- A7. The answer is yes. The label category should be determined by actual dose rates.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

A handwritten signature in black ink that reads "T. Glenn Foster". The signature is written in a cursive style with a long horizontal flourish extending to the right.

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division

Andrews
19-0034

January, Ikeya CTR (PHMSA)

From: INFOCNTR (PHMSA)
Sent: Friday, March 22, 2019 1:28 PM
To: Hazmat Interps
Subject: FW: Request for Interpretation per 49 CFR 105.20
Attachments: RRI LOI Request - Dose Rate Measurements (Mar 21, 2019).pdf

Hello Alice and Ikeya,

Please see the letter of interpretation request in the attached document.

Lynsie Patschke
Transportation Regulatory Specialist
Hazardous Materials Information Center (HMIC)

From: Wade Winters [mailto:wade@regulatoryresources.net]
Sent: Thursday, March 21, 2019 9:34 PM
To: PHMSA HM InfoCenter <PHMSAHMInfoCenter@dot.gov>
Cc: Conroy, Michael (PHMSA) <Michael.Conroy@dot.gov>
Subject: Request for Interpretation per 49 CFR 105.20

Dear Standards and Rulemaking,

Please accept the attached letter as a formal request for guidance as specified in 49 CFR 105.20.

Thank you,

Wade Winters

Regulatory Resources, Inc.
Your Training and Compliance Professionals
505-393-0111
www.reghead.net

This e-mail and any attachment(s) are confidential and may contain proprietary information of Regulatory Resources, Inc. This e-mail and any attachment(s) are intended solely for the person or entity to which it is addressed; they may contain legally privileged and protected matter. Any review, retransmission, dissemination or other use whatsoever by persons or entities other than the intended recipient(s) is strictly prohibited. If you received this in error, please delete the original transmission, destroy all electronic and hard copies, and notify the sender by return e-mail.

March 21, 2019

Mr. Shane Kelley
Director, Standards and Rulemaking Division
U.S. DOT/PHMSA (PHH-10)
1200 New Jersey Avenue, SE East Building, 2nd Floor
Washington, DC 20590

Dear Mr. Kelley,

I am seeking a formal interpretation per 49 CFR 105.20, *Guidance and interpretations*.

I recently conducted a nationwide open-seminar course on the subject of the US domestic Class 7 radioactive material packaging and transportation regulations. A discussion arose concerning the measurement of package dose rates. These questions concern 49 CFR 172.403, labeling for Class 7 (radioactive) material, specifically the lower dose rate threshold for label categorization, and for the allowance to be conservative in assigning a dose rate to a given package.

1. Situation. The dose rate instrument used for beta/gamma is typically taken with an instrument that has a typical minimum sensitivity of 0.1 mrem/h gamma. There are several neutron reading instruments used with a typical minimum sensitivity of approximately 0.25 mrem/h.

Package A. This package contains a radionuclide(s) that emit both gamma and neutron radiations.

A procedure requires both a gamma and neutron dose rate reading be taken at the surface and 1 meter from the package. If the dose rate is not detectable above the instruments minimum sensitivity at either location, is it acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation and categorize the package with the Class 7 label – i.e., Yellow II (0.1 mrem/h gamma + 0.25 mrem/h neutron = 0.35)?

Package B. This package contains a gamma emitting nuclide(s) only.

A procedure requires both a gamma and neutron dose rate reading be taken at the surface and 1 meter from the package. If the dose rate not detectable above the instrument's minimum sensitivity at either location, is it acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation (0.1 mrem/h gamma + 0.25 mrem/h neutron = 0.35) and categorize the package with the Class 7 label – i.e., Yellow II?

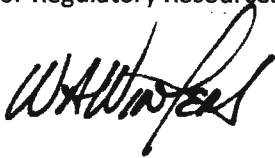
Package C. This package contains a beta-emitting nuclide only.

A procedure requires both a gamma and neutron dose rate reading be taken at the surface and 1 meter from the package. If the dose rate not detectable above the instrument's minimum sensitivity at either location, is it acceptable to assign the dose rate as the minimum detectable for gamma and neutron radiation (0.1 mrem/h gamma + 0.25 mrem/h neutron = 0.35) and categorize the package with the Class 7 label – i.e., Yellow II?

2. Is it acceptable to be conservative and assign a higher category of Class 7 label to a package than that indicated by dose rate measurements – i.e., Category Yellow II rather than a White I?
3. Is it expected that for Class 7 label category determination that the person determining the dose rates for the Class 7 label categorization use a dose rate instrument and measurement times capable of achieving the minimum dose rate stated for Class 7 label categorization, specifically, 0.05 mrem/h (total combined gamma and neutron when neutron emitters are present)?
4. Is it acceptable to use scientific calculations, considering the radioactive content and packaging configuration, to determine the dose rate at 1 meter rather than performing actual instrument dose rate measurements?
5. Would it be a violation of the DOT HMR if a corporate policy requires minimum instrument sensitivity be assigned as the dose rate of a package and the Class 7 label category determined from this regardless of the actual dose rates and nuclides present?

Thank you.

For Regulatory Resources, Inc.,



W. A. Winters
President