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

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

Mr. Christopher Purdom
Systems Technology Trainer
Chenega Technology Services Corporation
NEEMR/Customs and Border Protection
10720 Richmond Highway, Suite H
Lorton, VA 22079

Reference No.: 04-0159

Dear Mr. Purdom:

This responds to your letter requesting clarification of the shipping paper requirements for a Radioactive material in § 172.203 of the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180). Your questions are paraphrased and answered as follows:

Q1. Is a shipper required to list on the shipping paper only those radioactive isotopes that are listed on the package label?

A1. Although the radionuclides listed on the shipping paper and label are often the same, this is not always the case. Section 172.203(d) requires the description of a Radioactive material on a shipping paper to include the name of each radionuclide in the material that is listed in § 173.435. For mixtures of radionuclides, the radionuclides that must be shown on the shipping paper must be determined in accordance with § 173.433(g). Similarly, § 172.403 refers to § 173.435 and, in the case of mixtures, to § 173.433(g) for the names of radionuclides that must be shown on the label – with two exceptions: 1) in the case of LSA-I materials, the term "LSA-I" may be used on the label in place of the names of the radionuclides; and 2) in the case of mixtures of radionuclides, the HMR recognize that space on the label may limit the number of radionuclides that can be listed.

We moved the shipping paper and labeling requirements for radioactive materials in § 173.433 from paragraph (f) to paragraph (g) in a final rule published January 26, 2004 (RSPA Docket No. 99-6283 (HM-230); 69 FR 3677), but failed to update the references in §§ 172.203(d)(1) and 172.403(g)(1). This will be corrected in a future rulemaking.

Q2. Which radionuclides need not be considered when determining radionuclides that must be listed on the Radioactive label?

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172.203(d)

A2. For mixtures of radionuclides, you must use the formula in § 173.433(g) to determine which radionuclides in the mixture need not be listed on shipping papers and labels. The formula requires you to include enough of the radionuclides present to account for at least 95% of the total "hazard", where the "hazard" for radionuclide "i" is defined as the ratio of the activity ($a_{(i)}$) in the package to its corresponding A_1 (special form) or A_2 (normal form) value. Thus, you may omit listing radionuclides if the sum of $a_{(i)}/A_{(i)}$ of those omitted is no more than 5% of the sum of $a_{(i)}/A_{(i)}$ for all radionuclides in the package. Also see answer A1 above.

Q3. What does the term "mixture" mean?

A3. The term "mixture" is defined in § 171.8 to mean "a material composed of more than one chemical compound or element." In the case of a radioactive material shipment, for purposes of determining which isotopes to include in the shipping description and on the labels, and to calculate most of the effective basic radionuclide values (A_1 for the package, A_2 for the package, and the exempt consignment activity) in § 173.433, "mixture" refers to the combination of different radionuclides in the same package or consignment, even when they are separated physically from one another.

I trust this satisfies your request.

Sincerely,

Hattie L. Mitchell

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

Corbin
§172.203(d)
Shipping Papers
04-0159

10720 N. Richmond Hwy
Suite H
Lorton, VA 22079
(703) 493-8001 ext. 115

June 23, 2004

Mr. Edward T. Mazzullo
Director, Office of Hazardous Materials Standards
U.S. DOT/RSPA (DHM-10)
400 7th Street S.W.
Washington, D.C. 20590-0001

Dear Mr. Mazzullo:

Subject: Formal Clarification Request Concerning CFR 49 Part 172.203 (D)

I recently contacted the Hazmat Information Center concerning the listing of radioactive isotopes on labels and the shipper's declaration. I requested a formal clarification on Monday June 21, 2004. I received a call on Wednesday June 23, 2004 from Kurt of the Hazmat Information Center stating that radio nuclides must be listed on shipper's declaration as there are no space considerations. As stated in previous communications, this issue is at odds with two national radiation safety training classes. I forwarded Kurt's response to the other party, someone who certifies personnel to ship and receive radioactive materials. His response is:

> Thanks for the info. Since 172.203 Paragraph D sub-paragraph 2 refers the reader to 173.433(f) [for mixtures], this section clearly states that there may be radio nuclides in the mixture "that do not need to be considered". That is not to say that they are not detectable, just that the hazard relative to other radio nuclides is so low that the shipper does not need to declare them. Thus my comment in the class that the radio nuclides on the label should be the same as those indicated on the shipping paper to avoid confusion. While I applaud the work performed by Customs and others in the name of security, a little judgment is necessary in deciding action to be taken when scanning packages or containers. Instruments are a tool to help people do their job, but should not be used to replace humans.

His comments seem directly at odds with what the DOT Hazmat Information Center has informally told me twice now. So I do request formal clarification based on the information. Furthermore, what constitutes radio nuclides "that do not need to be considered"? To me, the radio nuclides that do not need to be considered would be PURE alpha emitters and beta emitters packaged so that they would not produce X-Rays through the bremsstrahlung effect that would be detectable outside the package. Any gamma or neutron emitter would be able to be detected outside of the package even with shielding. Uranium is able to be detected and identified by its gamma signature even though it is well shielded. Uranium has a very small gamma signal.

The first call on Monday June 21, 2004 stated that if the nuclide is on the table in CFR 49 Part 173.435, it needed to be listed on the shipper's declaration. Kurt, who called on Wednesday June 23, 2004, stated that there is no space consideration concerning the shipper's declaration so the nuclides should be listed in accordance with CFR 49 Part 172.203. He also referenced CFR 49 173.433 (f). It is here that the words "do not need to be considered" appear. However, CFR 49 173.433 (f) refers to a mixture. Does it apply to radioactive materials shipped in one package? What constitutes a "mixture"? It is imperative that this issue be cleared.

To summarize:

A formal clarification is requested concerning CFR 172.203 (d) concerning what must be listed on the shipper's declaration when compared to the package label.

The questions are:

1) Is a shipper only required to list on the shipper's declaration the radioactive isotopes listed on the package label?

2) What radio nuclides do not need to be considered when determining what must be listed on a label?
A) Does this specification relate to the shipper's declaration?

3) Does the term "mixture" apply to radioactive isotopes shipped in one container or must the isotopes be physically mixed?

DOT Hazmat Information Center personnel have stated on two occasions that the nuclides not listed on the label should be listed on the shipper's declaration because the shipper's declaration does not have a space available consideration. However, both responses have cited differing sources originating from CFR 49 Part 172.203 (d). The answers to these questions impact those shipping the radioactive materials as well as those looking for the radioactive materials in shipments.

I genuinely thank the DOT Hazmat Information Center for their time, efforts, and responses but do believe that a formal clarification is needed in order to ensure common interpretation through out the United States and abroad.

Christopher Purdom
Systems Technology Trainer
Chenega Technology Services Corporation
NEEMR/Customs and Border Protection