

**From:** "Charlie Simmons" <csimmons@athompsonlaw.com>  
**To:** <nrcprep@nrc.gov>  
**Date:** Fri, Jan 4, 2008 4:00 PM  
**Subject:** Comments on draft 2009 IAEA TS-R-1

comments attached.

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From: Charlie Simmons  
Sent: Friday, January 04, 2008 3:57 PM  
To: 'nrcprep@nrc.gov'  
Subject: Comments on draft 2009 IAEA TS-R-1

②  
November 21, 2007  
72 FR 65470

Dear Mr. Lesar:

Please see the attached file for comments on the 2009 draft IAEA TS-R-1 Regulations for the Safe Transport of Radioactive Material. Please contact me if you have any questions or comments. Thank you.

Charles T. Simmons

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**Creation Date** Fri, Jan 4, 2008 3:59 PM  
**From:** "Charlie Simmons" <csimmons@athompsonlaw.com>

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January 4, 2008

**VIA E-MAIL (nrcrep@nrc.gov)**

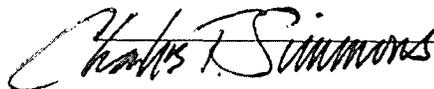
Michael T. Lesar  
Chief, Rulemaking, Directives and Editing Branch  
Mail Stop T6-D59  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**RE: Regulations for the Safe Transport of Radioactive Material; Notice of Document Availability and Request for Comments [72 Fed. Reg. 65470, November 21, 2007].**

Dear Mr. Lesar:

The following comments are submitted on the International Atomic Energy Agency's (IAEA's) 2009 draft TS-R-1 *Regulations for the Safe Transport of Radioactive Material* on behalf of Water Remediation Technology, LLC, a United States corporation that specializes in technology for the removal of radium, uranium and other contaminants from water. These comments are timely submitted pursuant to the above captioned Federal Register notice. Please do not hesitate to contact the undersigned if you have any questions or require further information.

Sincerely,



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Charles T. Simmons

## Comments

The 2009 draft TS-R-1 incorporates Paragraph 107(e) of the 2005 edition of TS-R-1 with only a minor change in wording (“that” is replaced by “which”). Problems caused by interpretations by regulatory bodies and recent IAEA opinions on the scope of regulation of naturally occurring radioactive materials render this an opportune time to address the shortcomings of Paragraph 107(e) and make appropriate clarifications.

Paragraph 107(e) provides a qualified exclusion of “natural materials and ores” from the scope of regulation.

107. These Regulations do not apply to:

(e) natural material and ores containing naturally-occurring radionuclides which are either in their natural state, or have only been processed for purposes other than for extraction of the radionuclides, and which are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in paras 403(b), or calculated in accordance with paras 404–408;

The qualifications for exclusion from scope of regulation set forth in para 107(e) are problematic because “natural materials and ores” are not defined in the regulation (or in accompanying interpretive guidance TS-G-1.1). The quality of ‘naturalness’ of a radionuclide-bearing material is therefore open to subjective interpretation which can result in inconsistent regulation. Regulatory bodies should be provided with a clear expression that “natural” means naturally occurring radionuclides, consistent with IAEA’s views on the scope of regulation of naturally occurring radioactive materials. An example of one regulatory body’s interpretation of “natural materials,” the U.S. Department of Transportation (DOT) has determined that naturally occurring radium, once removed from drinking water, is no longer “natural” :

Q1. Does the exception for “natural materials” in § 173.401(b)(4) include naturally occurring zeolite water treatment medium that have absorbed naturally occurring radionuclides from public drinking water supplies and are intended to be managed as a waste?<sup>1</sup>

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<sup>1</sup> The referenced regulation, 49 CFR 173.401(b)(4) is substantially the same as TS-R-1 Paragraph 107(e) and excludes the following from the scope of regulation:

A1. The answer is no. The term “natural materials” in § 173.401(b)(4) means materials and radionuclides existing in nature, not those produced by humans. Radionuclides addressed by § 173.401(b)(4) do not include those contained in filters used in removal of radionuclides from drinking water, produced in nuclear reactors, or by other technological means. In the scenario described in your letter, the naturally occurring radionuclides in public drinking water supplies are absorbed onto zeolite medium through at water treatment process. Therefore, these radionuclides, while naturally occurring in the pre-treatment drinking water, are not naturally occurring in the zeolite medium since they are transferred from one medium to another medium (i.e., the water). If the zeolite medium contains naturally occurring radionuclides prior to its use as a filtering medium, the exception in § 173.401(b)(4) is applicable. However, after the drinking water is processed through the zeolite medium and additional radionuclides are absorbed, § 173.401(b)(4) does not apply.<sup>2</sup>

This example of regulatory interpretation is contrary to views expressed by IAEA on the regulation of naturally occurring radioactive materials (NORM), where the Agency states that the focus of regulation should be on the natural radionuclides themselves, and not on the material containing the radionuclides or the manner in which such material obtained them:

The term NORM has become firmly entrenched in our technical vocabulary, but as an acronym for ‘naturally occurring radioactive material’ it is actually a misnomer — the descriptor ‘naturally occurring’ refers to the radionuclides in the material and not necessarily to the material itself, which may well be a product of a physical, chemical or thermal industrial process. ... Clearly, there is a need to single out only those few materials that are of radiological concern.

One attempt to do this has been through the introduction of a new term — TENORM (‘technologically enhanced naturally radioactive material’). However, this approach does not solve the problem and, indeed, can be misleading, because it implies that the materials of concern are limited to those in which the radionuclides have become concentrated as a result of an industrial process. . . . Materials in their natural state are in principle no less important to consider than materials with activity concentrations enhanced by some form of processing and any distinction between the two for the purposes of radiation protection is artificial and without any scientific foundation

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Natural material and ores containing naturally occurring radionuclides which are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in § 173.436.

<sup>2</sup> June 26, 2006 letter from Hattie Mitchell, U.S. DOT, to C.T. Simmons.

The approach adopted by the IAEA for the purposes of international radiation protection standards is to use only the term NORM, regardless of the origin of the material, while defining 'radioactive material' more narrowly as "material that is designated in national law or by a regulatory body as being subject to regulatory control because of its radioactivity" [footnote omitted]. NORM is then a particular form of radioactive material (defined in the narrower sense) where the radioactivity in question is associated with radionuclides of natural origin. This approach solves the problem of how to single out only those materials of radiological concern, while avoiding the need for any additional and potentially misleading terms such as TENORM, the use of which is therefore discouraged.<sup>3</sup>

It should be clarified in TS-R-1 and/or accompanying guidance that "natural materials" includes materials that *contain* naturally occurring radionuclides. Once a radionuclide is "natural" it is always natural. The "naturalness" of naturally occurring Ra-226 in water does not change upon partitioning to another material, and TS-R-1 or Guidance needs to include the following clarification

The term "natural materials" includes materials containing any radionuclides of natural origin (e.g., primordial or cosmogenic) and is independent of the material itself.

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<sup>3</sup> Wymer, Denis, IAEA Division of Radiation, Transport and Waste Safety, *Managing Exposure to NORM – Consensus or Chaos?* Paper presented at Fifth International NORM Symposium (NORM V), Seville, Spain (March 2007).