

1250 CONNECTICUT AVENUE, N.W.
SUITE 200
WASHINGTON, D.C. 20036
DIRECT (202) 261-6542
FAX (202) 261-3508
MOBILE (202) 669-8971
E-MAIL csimmons@csimmonsllaw.com

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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

February 15, 2011

Via E-Mail

Rulemaking.Comments@nrc.gov

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555-0001

RE: Docket ID NRC-2009-0084

**Distribution of Source Material to Exempt Persons and to General Licensees and
Revision of General License and Exemptions [75 Fed. Reg. 43425; 75 Fed. Reg. 70618]**

Dear Sir or Madam:

The following comments are submitted with respect to the above-captioned rulemaking on behalf of the Zirconium Environmental Committee ("ZEC"). The ZEC is a collection of companies that are engaged in the mining, production, research and development, and commercial distribution of zircon, Zirconia, and zirconium metal in a variety of forms and products.

In nature, the minerals zircon and Zirconia are inextricably affiliated with the naturally occurring radioactive elements uranium ("U") and thorium ("Th"), at concentrations that vary with the geology of the mineral deposit.

At the present time, the raw materials and finished products used by the ZEC are below 0.05% U and/or Th by weight and are considered "unimportant quantities of source material" pursuant to 10 CFR 40.13(a). However, external market forces, including unprecedented materials demand by Asian countries and consequent pressure for increased raw material exploration, as well as increased research and development needs for novel technologies, lead to a plausible future scenario wherein certain raw materials may only be available at U and/or Th concentrations at or exceeding 0.05%. Consequently, the proposed rulemaking may potentially affect the regulatory status of materials used by the ZEC.

I. Ceramics

Comment: NRC should clarify that the scope of the term "other glass or ceramic" as it appears in proposed 10 CFR 40.13(c)(2)(iii) extends to industrial-use ceramics that are not used in residential or commercial building construction.

Template = SECY-067

DS 10

The terms "glassware" and "ceramics" are used to describe certain exempt materials containing source material under 10 CFR 40.13(c). Because "ceramics" are not defined in NRC's regulations, the common definition of the term applies. Words that are not terms of art and that are not statutorily defined are customarily given their ordinary meanings, often derived from the dictionary.¹ "Ceramics" are defined as "Any of various hard, brittle, heat-resistant and corrosion-resistant materials made by firing clay or other minerals and consisting of one or more metals in combination with a nonmetal, usually oxygen."²

Common and familiar ceramics include such traditional brick or block used in building construction, tile and sanitaryware, cookware and tableware, and household fixtures and decorative objects used in or around the home. Advanced industrial ceramics, on the other hand, are distinct from such familiar domestic applications, and represent a class of ceramic materials that are used exclusively in industrial applications, which for example include:

- High temperature refractory crucibles, blocks and shapes that are used to melt, pour and form steel and superalloy castings typically used in strategic applications (e.g., jet propulsion components); and
- Thermal barrier coatings used on jet turbine engines to maintain longevity and high temperature operating efficiency;
- Catalysts used in chemical manufacturing and air pollution control devices; and
- Electronic components such as microwave transducers.

The above advanced ceramics applications represent a subset of the universe of ceramic materials for which end uses are exclusively industrial.

Proposed 10 CFR 40.13(c) intends to lower the allowable source material content of materials exempt under this rule from 10 percent to 2 percent by weight, and taken in its entirety, reads as follows:

(c) Any person is exempt from the requirements for a license set forth in section 62 of the Act and from the regulations in this part and parts 19, 20, and 21 of this chapter to the extent that such person receives, possesses, uses or transfers:

(2)

(iii) Glassware containing not more than 2 percent by weight source material or, for glassware manufactured before [effective date of final rule], 10 percent by weight source material; but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic used in construction.

Expressly excluded from the exemption are materials "used in construction" if such materials are "commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic."

¹ In the absence of a statutory definition, "we construe a statutory term in accordance with its ordinary or natural meaning." *FDIC v. Meyer*, 510 U.S. 471, 476 (1994).

² *The American Heritage Dictionary of the English Language* (1973).

It is reasonable to believe that the phrase “used in construction” means used in construction of residential or commercial buildings where people live or work, and not “used in construction” of industrial crucibles, jet engines, chemical manufacturing facilities or military radar. This view is supported by an NRC communication to the State of California regarding the scope of 10 CFR 40.22 and 10 CFR 40.13(c)(2)(iii) with respect to glazed ceramic tiles removed from a commercial building and containing up to 10 percent source material:

The general license in 10 CFR 40.22 applies to small quantities of source material used for “research, development, educational, commercial or operational purposes.” Tiles used in public and private buildings are not within the permitted uses of this general license. ... Likewise, current 10 CFR 40.13(c)(2)(iii) does not apply, since it excludes commercially manufactured ceramic tile and other ceramic *used in construction*.³

Accordingly, it can be concluded that the exemption of 10 CFR 40.13(c)(2)(iii) extends to “ceramic tile and other ceramic” provided such materials are not used in construction of residential and commercial buildings where people live and work.

The term “ceramic” is used elsewhere in existing and proposed 10 CFR 40.13(c) to expressly limit the source material content of certain species of ceramic that are used for particular end-uses which could include uses as consumer products in and around the home:

- (2)
 - (i) Glazed ceramic tableware manufactured before [effective date of final rule], provided that the glaze contains not more than 20 percent by weight source material;
 - (ii) Piezoelectric ceramic containing not more than 2 percent by weight source material

Ordinarily, the specific terms of a statute or regulation override the general terms. “However inclusive may be the general language of a statute, it will not be held to apply to a matter specifically dealt with in another part of the same enactment.”⁴ Thus, “commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic” is limited to 10 percent source material content by 40.13(c)(2)(iii) (and 2 percent by the proposed rule) does not include ceramic in the form of glazed ceramic tableware which may contain up to 20 percent source material under 40.13(c)(2)(i) (and proposed to be limited to the effective date of the final rule) or ceramic that is piezoelectric, which is limited to 2 percent source material under 40.13(c)(2)(ii) (and is not affected by the final rule). Therefore, it is reasonable and appropriate to conclude that “commercially manufactured tile and other ceramic” in 40.13(c)(2)(iii) includes all ceramic materials other than glazed ceramic dinnerware and piezoelectric ceramic, and exempts from regulation only those ceramics, not expressly addressed elsewhere in the rule, provided they are not used in the construction of residential or commercial buildings.

II. Threshold for licensable source material

³ Paul H. Lohaus, Director, Office of State and Tribal Programs to Edgar Bailey, Chief, Radiologic Health Branch, Division of Food, Drug and Radiation Safety, California Department of Health Services (August 13, 2003) (emphasis supplied).

⁴ *Fourco Glass Co. v. Transmirra Products Corp.*, 353 U.S. 222, 228 (1957).

Comment: NRC should clarify that compliance assessment of uranium and/or thorium in a material may be reported to three significant figures, if justified by analytical accuracy and precision.

Materials that exceed one-twentieth of 1 percent uranium and/or thorium are subject to general or specific licensing by NRC. 10 CFR 40.13(a); 40.22. In the proposed rule, existing 40.13(a) and elsewhere NRC describes the one-twentieth of one percent licensing threshold as "0.05 percent," which is a number reported to two significant figures. Given the current proposed rule's increased restrictions on generally licensed source material, and a general desire for industrial users of zircon and Zirconia to avoid materials that are not "unimportant quantities," it is important that a sense of certainty be attained with respect to how analytical data for uranium and thorium in an analyte are evaluated against the "0.05%" threshold for licensable source material.

The regulatory language of 40.13(a) "one twentieth of one percent" describes a fraction of a fraction, and provides a numerical example in parenthesis ("0.05%"). However, the number of significant figures to which one-twentieth of one percent is reported should be limited by the analytical capability of the method used.

It is common practice in industry to use x-ray fluorescence ("XRF") to determine the uranium and thorium content of zircon and Zirconia, with analytical uncertainty of +/- 20 ppm (6 sigma at 500 ppm). In many applications (e.g., aerospace) there is no allowance for disregarding valid tests, and the final reported number is an average of all valid tests, following accepted rounding convention (ASTM E 29).

Following accepted rounding convention, an analytical value of 0.049% rounds to 0.05% and thus licensable source material, if reporting to two significant figures is required by 40.13(a), even though it is not one-twentieth of one percent.

Given the improvement in analytical sensitivity over the years since NRC first expressed one-twentieth of one percent as 0.05 percent, it is appropriate to clarify that the number of significant figures to which source material content is reported should be limited by the validated accuracy and precision of the analytical method used.

III. Conclusions

1. The requested clarification with respect to 10 CFR 40.13(c)(2)(iii) would provide continuity in developing advanced ceramics to meet the needs of industry and the common defense and security.
2. The requested clarification with respect to reporting source material content would improve industry's ability to maintain regulatory compliance.

Thank you for the opportunity to provide comments on NRC's proposed rulemaking. Please do not hesitate to contact the undersigned if you have questions regarding these comments or require further information.

Sincerely,

Charles T. Simmons

Charles T. Simmons

Rulemaking Comments

From: csimmons@csimmonslaw.com
Sent: Wednesday, February 16, 2011 1:11 PM
To: Rulemaking Comments
Cc: Comfort, Gary
Subject: RE: Comments on Docket ID NRC-2009-0084
Attachments: ZEC Comments 2011 02 15 cts.pdf

Dear Ms. Ngbea:

The attached file is the comment document in pdf format. I certify that this document is the same document that was sent to NRC at 7:59 pm on 02/15/2011.

Thank you.

Charlie Simmons

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Date: Wed, 16 Feb 2011 13:11:07 -0500

From: "csimmons@csimmonslaw.com" <csimmons@csimmonslaw.com>

To: Rulemaking Comments <Rulemaking.Comments@nrc.gov>

CC: "Comfort, Gary" <Gary.Comfort@nrc.gov>

Message-ID:

<10401215.18017.1297879867815.JavaMail.vpopmail@oxapp6.mgt.hosting.dc2.netsol.com>

In-Reply-To:

<377CB97DD54F0F4FAAC7E9FD88BCA6D0513BFDD687@HQCLSTR01.nrc.gov>

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