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To Paul Laine - NM550/press

Company USNRC

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From LOREN MAAS

Telephone 509-375-8537 MB 16

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Message

Paul

1/18/00

Here's a draft of most of what we promised. We were under the impression that you may be talking to the Washington Dept of Health in the near term & thus we are sending you this now. We are still developing our response to the Tc-99 question. We don't believe it represents a problem but are still not sure of the best way to categorically state it. Please call if you have questions or comments. Thanks. LOREN MAAS

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 2101 Horn Rapids Road
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A17

DRAFT

January 17, 2000
LJM:00:004

U.S. Nuclear Regulatory Commission
Attn: Paul W. Lain
NMSS/FCSS/FCLB
Mail Stop 8 D14
Washington, DC 20555-0001

Dear Mr. Lain:

Subject: Washington Department of Health Comments on Environmental Assessment for Siemens Power Corporation to Sell Ammonium Nitrate/Ammonium Hydroxide Solution (TAC No. L31208)

As a result of the telephone conversation among you, Linda Suttora, and Julie Olivier of the NRC and Jim Edgar, Syd Koegler, Rich Burklin, Ray Vaughan and myself of Siemens Power Corporation (SPC) on January 12 regarding the NRC's response to the subject Washington State Department of Health (WDOH) comments, SPC agreed to provide information on the affected environment, how 1 ppm uranium in the fertilizer is equated to an activity of 3 pCi/ml, and a discussion of Tc-99.

Affected Environment

It is expected that SPC's ammonium hydroxide/ammonium nitrate solution will be used primarily for fertilizing dry land wheat. The application is seasonal, usually late fall or early spring. The typical application of aqua ammonia (ammonium hydroxide) solution for dry land wheat is to inject the solution into the top three inches of soil. This is done to prevent evaporation of the ammonia while allowing soil bacteria to reduce the ammonia to nitrate which the plants can use. Although the SPC solution contains ammonium nitrate as well as ammonium hydroxide, the presence of the ammonium hydroxide will likely dictate that it be used in the same manner as pure ammonium hydroxide solution, i.e. soil injection. While the use of SPC fertilizer solution will not be restricted to the local area, the cost of transporting the relatively low-nitrogen-concentration solution will economically limit wider distribution. Therefore, the area of distribution will likely be limited to southeastern Washington.

Activity of Fertilizer

The assumption that 1 ppm U in the fertilizer solution would be equivalent to 3 pCi/ml activity was based on the data in Table 2 of SPC's May 19, 1999 amendment request. The one piece of data not provided was the density of the fertilizer solution, which is necessary to convert the

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solution activity from a per gram to a per milliliter basis. The density utilized for the May 19 submittal was 1.15 g/ml, which in retrospect should have been 1.05 g/ml. (The effect of this error is small and conservative). Table 2 data is repeated in the attached table, along with an extra data column depicting the density conversion (utilizing the correct 1.05 g/ml density value). As can be seen, the calculated activity level of 2.73 pCi/ml is slightly lower than the previously calculated 2.99 pCi/ml, but still essentially 3 pCi/ml.

For comparison sake, specific activities for 5% enriched uranium calculated per the formula in 10CFR20 Appendix B or derived from Table A-3 of 10CFR71 Appendix A are 2.39×10^{-6} Ci/g and 2.7×10^{-6} Ci/g, respectively. Total fertilizer solution activities at 1 ppm U, converted to pCi/ml based on a solution density of 1.05 g/ml, are 2.51 pCi/ml and 2.84 pCi/ml, respectively. The Siemens-specific calculated value of 2.73 pCi/ml compares closely with these regulatory-derived values. The 3 pCi/ml assumption utilized in SPC's amendment request is bounding with respect to all three calculated values.

Tc-99

(Response being developed)

Calculated Activity for Line 2 ADU/MURS Solution Containing 1 ppm Uranium, 5% Enrichment

Isotope	Isotope%	Isotope Spec. Activity (Ci/g)	Contributed Activity (Ci/g)	Contributed Activity at 1 ppm U (Ci/g)	Contributed Activity at 1 ppm (Ci/ml)	Total Solution Activity (pCi/ml)
U-232	0	2.09 E+01	0			2.73
U-234	0.035	6.19 E-03	2.17 E-06	2.17 E-12	2.27 E-12	
U-235	5	2.14 E-06	1.07 E-07	1.07 E-13	1.12 E-13	
U-236	0.028	6.34 E-05	1.77 E-08	1.77 E-14	1.86 E-14	
U-238	94.937	3.33 E-07	3.16 E-07	3.16 E-13	<u>3.32 E-13</u> 2.73 E-12 (total)	

	4Ci/mL Activity	10CFR20 Monthly Sewer Activity	10CFR20 Effl. Conc. 4Ci/mL
U-232	0	6E-7	6E-8
U-234	2.27E-6	3E-6	3E-7
U-235	1.12E-7	3E-6	3E-7
U-236	1.86E-8	3E-6	3E-7
U-238	3.32E-7	3E-6	3E-7

3E-6 4Ci/mL