

From: Struckmeyer, Richard
Sent: Friday, August 22, 2014 2:34 PM
To: Leonhardt, Darrin
Subject: More questions

Mr. Leonhardt:

Thank you for your letter of August 14, 2014, in response to my question concerning the radiation level from electron tubes containing Kr-85.

Your letter did not include any statement of the basis for the assumptions that were made in the calculation of the beta dose.

Please explain why the choice was made to use a cylindrical source geometry. This geometry is described in the Varskin 5 Help file, and in NUREG/CR-6918, Revision 2, "VARSKIN 5: A Computer Code for Skin Contamination Dosimetry." (I no longer have the Varskin 3 code; however I believe its Help file also contained such a description.) The cylindrical source resembles a coin, and its orientation is parallel to the skin. The source-to-skin distance would be measured from the underside of the coin to the surface of the skin (in this case, 1 cm). The thickness of the cylinder can be envisioned as the thickness of the coin from its underside to its top. The diameter of the cylinder can be envisioned as the diameter of the coin when observing its face. This geometry does not appear to be an appropriate model for your electron tubes. Although Varskin does not offer a geometry that matches the electron tube configuration, a better approximation may be the slab geometry.

Also please explain why the following parameters were used in the beta-dose calculation:

Cover Material Thickness: 1.00E+00 cm
Cover Material Density: 1.00E+00 g/cm³
Source Density: 3.48E+00 kg/m³

Finally, please explain why the choice was made to use a cover material rather than an air gap in the calculation (i.e., the air gap thickness = 0 mm).

I will be away from my office from August 25 through September 1, so I will not have an opportunity to review your response until I return.

Thank you,

Richard K. Struckmeyer
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