Dr Luke

Project SNM-8
Docket 70-36

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(THRU) Clifford K. Beck, Chief, Hazards Evaluation Branch

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MALLINCKRODT CHEMICAL WORKS

Mr. Gervaise W. Tompkin telephoned with reference to their shipping containers for uranium oxide. Their current interest is in shipment of 4.6% enrichment, and Tompkin is preparing an application including shipment of limited safe masses, spaced according to the solid angle criterion, with the assumed value of 0.65 for $k_{eff}$ (ref: Memo CKB to LEJ, 4/27/59).

Mr. Tompkins asked how the distance "h" was measured for the solid angle calculation (see p.64, Draft Guide, Final Version, May 1959). I told him "h" was the horizontal distance, in a horizontal planar array, from the center of one inner container to the edge of the next inner container. I also reminded him that he should include the sum of the solid angles not only from the central container to the surrounding six containers, but also to the six containers in the next circle which "see" the central container.

He asked about the appropriate value of $k_{eff}$ for uranium dioxide. I told him that where mass is the control variable, k = 0.65 is applicable. Where geometry is the control variable, k = 0.8 is applicable except for 5" I.D. containers where k = 0.58.

HEB:DL&R
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