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OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

August 25, 1982

Secretary of the Commission  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

DOCKET NUMBER  
PROPOSED RULE PR-Misc. Notice  
(Reg Guide)

Attention: Docketing and Service Branch

Subject: Proposed Revision 1 to Regulatory Guide 5.34

Identification

Comment

Bottom of Page 2  
Top of Page 3

Should be changed to read "...isotopic compositions of plutonium with the exception of  $^{242}\text{Pu}$ ..."

Middle of Page 3

The accuracy of SFD is dependent on the accuracy of analysis for the minor Pu isotopes. Note that from Table 2 of the guide for 38000-40000 MWd/t burnup, the  $^{242}\text{Pu}$  contributes approximately 38% of the  $^{240}\text{Pu}$  effective mass. This is particularly important since the guide states that "the isotopic composition of plutonium in scrap materials can be obtained quite reliably using high-resolution gamma-ray spectrometry measurements. In fact,  $^{242}\text{Pu}$  cannot be directly measured for the type of samples listed in Table 2.

With respect to the americium-241 ingrowth, in scrap samples the  $(\alpha, n)$  yield may increase with time due to the Am ingrowth and thereby effect the neutron multiplication corrections.

Page 4

The discussion of effective plutonium-240 is inadequate and confusing. While the factors "are known only to approximately 5%", the difference in the 238 factor changes approximately 9% between the two forms of the equation.

DS-09  
add: Ed Hill  
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Acknowledged by card

8/30/82 emp

In addition, on Page 63 of LA-7779-M (1979), "The High-Level Neutron Coincidence Counter (HLNCC): Users' Manual", the need to account for the coincidence-counting efficiency of the coincidence hardware is documented. Perhaps the formula should be presented incorporating the efficiency terms as is done on Page 13 of NUREG/CR-0975 (MLM-2695)[1980]. Note that more recent references for the 238 and 242 factors are cited in that report. However no attempt is made to make critical evaluation.

Page 10

Table 2 - Pu-238 has been omitted.

Page 12

The style for citing references should be reviewed. For Ref. 2, NUREG-0228, the author W. W. Rodenburg is not given while for Ref. 14, NUREG/CR-1847, the authors are given.

Reference 1 should be expanded for gamma-ray isotopic ratio measurements. For example:

Sampson, R.E., Hsue, S., Parker, J., Johnson S. and Bowersox, D. "The Determination of Plutonium Isotopic Composition by Gamma-Ray Spectroscopy", Fifth Symposium X- and Gamma-Rays in Ann Arbor, Mi, June 1981, Preprint.

Fleissner, J. G., "GRPAUT: A Computer Code for Automated Analysis of Plutonium Spectra", Proceedings of the Institute of Nuclear Materials Management, Vol. X, July 1981, p461-466.

Ruhter, W. and Camp, D. C., "A Portable Computer to Reduce Gamma-ray Spectra for Plutonium Isotopic Ratios", UCRL-53145 (ISPO-134), May 1981.

Gunnink, R., "Plutonium Isotopic Analysis of Nondescript Samples by Gamma-ray Spectrometry", UCRL-86737 Preprint Conference on Analytical Chemistry in Energy Technology, Gatlinburg, TN, September 1981.

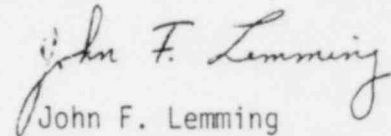
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References 3-5

For a general discussion of coincidence counting add:

M. S. Zucker, "Neutron Correlation Counting for the Nondestructive Analysis of Nuclear Materials", in Analytical Methods for Safeguards and Accountability Measurements of Special Nuclear Materials, NBS Special Publication 528 (November 1978), pp261-283.

Very truly yours,

  
John F. Lemming

JFL/ag