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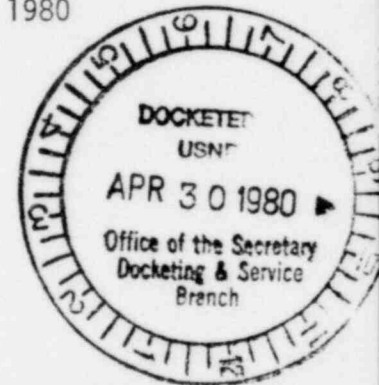
DOCKET NUMBER
PROPOSED RULE PR-Misc. Reg. Guide

April 28, 1980

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

Attn: Docketing and Service Branch

Dear Sirs:



Comment on Proposed Revision 2 to Regulatory Guide 8.14 - "Personnel
Neutron Dosimeters"

I would like to make the following detailed comments on the draft:

Section B - Discussion

Comment: The opening paragraph refers to the omission of accuracy criteria in ANSI N319-1976 (Personnel Neutron Dosimeters [Neutrons less than 20 MeV]). In the second paragraph the draft goes on to state, "This guide supplements the standard by adding an accuracy requirement." As I shall show in my discussion of Section C. 2 (Performance Standards) this claim is misleading, if not totally inaccurate.

Section C - Regulatory Position

1. Personnel Neutron Dosimetry Techniques

(a) Using more sensitive dosimeters P. 3, lines 3-4:

"NTA film may be used as a dosimeter -- if (1) humidity can be controlled --"

Comment: This sentence is misleading and inaccurate. Where the neutron spectrum is such that NTA is an appropriate dosimeter it is not necessary to "Control the humidity" - a surely difficult task!! It is necessary to either (a) Prevent track fading by correct packaging of the NTA film or (b) Determine the amount of fading and apply the necessary correction. In many cases this correction is <20% over 4 weeks. It is only under conditions of both high RH and high temperature that fading is a serious problem special packaging is required (Innumerable references in the scientific literature substantiate this point).

Acknowledged by card. 5/12/80...mdv...

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(b) Calculated Neutron Dose Equivalent to Supplement Neutron Dosimeter P. 3, lines 4-10:

"Calculated dose equivalents may be based on neutron dose equivalent rates as measured by rem meter survey instruments (using either the Andersson-Braun or Hankins design) and known personnel occupancy times. Another alternative to calculated dose equivalents is the use of the neutron/gamma ratio. The neutron/gamma ratio is acceptable only if it has been established by prior use of rem meter survey instruments that the neutron/gamma ratio is virtually constant (e.g., $\pm 50\%$) throughout each area that personnel may occupy."

Comment: It is overly restrictive to require that rem meter survey instruments be used in radiation surveys to calculate neutron dose equivalent or to determine the n/γ ratio. Under some spectral conditions neutron rem meters may seriously over-estimate the neutron dose equivalent. There are many other acceptable techniques that should be permitted, e.g. Bonner Spheres; activation detectors.

2. Performance Requirements

"c. The following requirements should be added: "When exposed to an unmoderated Californium - 252 source, the average accuracy of a set of 10 dosimeters exposed in the range from 100 mrems to 3 rems should be $\pm 50\%$ ".

Comment: This so called "accuracy specification" is not sufficiently precise to be of any real value. It is a specification for the accuracy of calibration but does not specify how the calibration should be performed e.g. with the dosimeter in free air?; on a phantom?; if on a phantom whether on the front or back?; at what distance from the Cf^{252} source?; how should scattered neutrons be corrected for" etc., etc. Furthermore, the accuracy required is expressed in terms of dose equivalent without specifying at what depth in tissue the dose equivalent is to be calculated, or how the dose equivalent is to be calculated from the basic dosimeter data. Unless these factors are defined more precisely the claim that the reg. guide adds accuracy criteria to ANSI N319-1976 is erroneous.

3. Meeting the Fading Requirements of the Standard

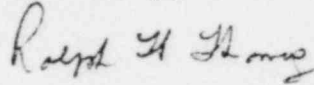
Comment: Since it is only with nuclear emulsion that humidity is a significant cause of fading this paragraph is unnecessarily obscure. RH does not play a large part in the fading of TLD readings!

Finally, I would like to be permitted the luxury of a general comment. I believe it is unfortunate that the NRC has in this case attempted to improve ANSI N319-1976. This standard was the result of the considered opinions of some of the most competent neutron dosimetrists in the country.

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I believe it omitted a precise statement on accuracy of personal dosimetry because such a statement was premature. I believe that such a statement at this time would still be premature. NCRP, ICRP, and ICRU are all actively considering the accuracy of DE evaluation. This NRC draft does little to help those interested in solving the practical problems of neutron dosimetry. In the event of litigation it is potentially extremely misleading.

Yours truly,



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RHT:mc

cc: H. J. Pettengill, NRC