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APS

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Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
U. S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington, DC 20555-0001

7/24/03
68 FR 43769
(5)

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528/529/530
Comments on "Proposed Generic Communication - Method for Estimating Effective Dose Equivalent From External Radiation Sources Using Two Dosimeters" (68 FR 43769, dated 07/24/2003)

Arizona Public Service (APS) endorses the comments submitted by the Nuclear Energy Institute (NEI) in a letter from Ralph L. Anderson to the NRC dated September 23, 2003, on the "Proposed Generic Communication - Method for Estimating Effective Dose Equivalent From External Radiation Sources Using Two Dosimeters (68 FR 43769, dated 07/24/2003). In addition, attached are the APS comments on the proposed generic communication.

Should you have any questions, please contact Thomas N. Weber (623) 393-5764.

Sincerely,

Scott A. Bauer

SAB/TNW/RKR/kg

Attachment – Comments on Proposed Generic Communication

cc: B. S. Mallett NRC Region IV Regional Administrator
M. B. Fields NRC NRR Project Manager
N. L. Salgado NRC Senior Resident Inspector for PVNGS

Template = ADM-013

E-RFDS = ADM-03
Cole = C. Petrone (COP)
S. Sherbini (SXS2)
R. Pedersen (RIP1)

Attachment

Comments on Proposed Generic Communication

Comments on Proposed Generic Communication

The Palo Verde Nuclear Generating Station supports external effective dose equivalent (EDE) as a substitute for external dosimetry for measuring deep dose equivalent (DDE). The highest one centimeter (cm) DDE is difficult to locate and measure, and it is an inappropriate biological endpoint. EDE provides a better assessment of whole body dose to individuals. This line of reasoning is most clearly demonstrated when evaluating the dose from radioactive contamination on the body or when a person is in close proximity to a hot spot. In those cases, the EDE is a far more appropriate indicator of an individual's deep dose.

While the justifications for external EDE are quite extensive and persuasive, we believe that the EPRI two-badge method needs some clarification. Specifically, for the very few jobs in radiological environments with gradients, using the two-badge system only could provide incomplete monitoring for all organ doses. Clearly, EDE can be measured more accurately with a chest and a back dosimeter, however, the lens dose equivalent (LDE) and shallow dose equivalent (SDE) should still be monitored with other dosimeters.

The EPRI Two Dosimeter Method allows for more efficient measurement of EDE using one dosimeter for routine jobs or two dosimeters for special jobs. This can be and has been taken by some licensees to mean that no more than two dosimeters would ever be used. In practice, licensees routinely issue multiple dosimeters whenever known specific gradient criteria exist. With EDE, licensees may need further guidance on the continued use of multi-badging in order to monitor for LDE and SDE. It is our belief that with EDE, monitoring for LDE and SDE remains important in certain situations.

As noted, external EDE is an appropriate substitute for DDE. However, the two-badge EDE system should be used for its primary intent: to correct the problem that exists in gradient radiological environments where the highest location on the body has defined the deep dose to the entire body. Multi-badging for other body locations must continue though to obtain the dose profiles to which the workers are exposed: organ doses, SDE, and LDE. This is especially true for partial-body irradiations where the radiological environment is complex. Therefore, Palo Verde recommends that:

- Multiple dosimeters are issued (as needed, often more than two) to evaluate worker dose profiles in gradient radiation fields utilizing appropriate criteria.

- Measurements of the specific body locations are used to assist in ALARA efforts for those workers on those tasks.

- Front and back dosimeters can be used to determine the EDE. Other dosimeters on the whole body would be used to measure the LDE, SDE and any other important organ doses.

For example, if a worker was exposed to an overhead source of photons and his head dosimeter reads 250 mrem, his upper arm dosimeters read 120 mrem, his chest dosimeter reads 80 mrem, and his back dosimeter reads 60 mrem, we believe the following should be recorded:

SDE = 250 mrem
LDE = 250 mrem
EDE = 75 mrem

With the new process, the EDE would be calculated using the EPRI Weighted Method as *½*(80 + (80+60)/2) = 75 mrem.* We believe that LDE should be based on the head dosimeter, and the shallow dose equivalent to the whole body (SDE/WB) should be based on the highest dosimeter worn at a whole body location. Previously, licensees have been required to record the same 250 mrem for all: SDE, LDE, and DDE. Consequently, this is a major improvement in the suitability of the whole body dose measurements in gradients. We recommend continuing to issue dosimeters at whole body locations expected to receive the highest dose and that this methodology should be included in the RIS. It is our opinion that workers will understand this as better dosimetry, as it measures their entire dose profile. A supplemental benefit of appropriate multi-badging is that the external EDE could be recalculated with other methodologies at any later time, such as with ANSI 13.41. That methodology allows the use of appropriate weighting factors associated with various whole body locations.

If licensees decided not to issue more than front and back dosimeters in gradient radiological environments, they would have a difficult time making every reasonable effort to maintain exposures to radiation as far below the dose limits as possible, and organ doses would not be measured. These licensees would record 75 mrem for EDE in this example. But it is unclear what they could record for LDE and SDE: 75 mrem, 80 mrem, Not Required? By continuing to multi-badge, they would know and record the appropriate doses.

We completely agree that the EDE is a more accurate assessment of whole body deep dose, however, there is a potential to misuse it in non-gradient situations. If licensees are allowed to freely decide when they will or won't issue two badges, this may lead to worker concerns. The industry should develop guidance on when to use the two-badge method in non-gradient radiological environments.

NCRP 122 summarized that a single front dosimeter provides conservative EDE measurements for almost all of the individual radiation exposures. This EPRI work should be used to confirm that NCRP position so that our workforces will know that our dosimetry has been conservative for them and will have appropriate confidence in our programs. In summary, we believe that the RIS should clarify the monitoring of LDE and SDE through appropriate multi-badging and that more guidance is needed regarding when to use the two-badge method in non-gradient situations.