Review of ORAUT-OTIB-0093, Revision 00

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Subcommittee for Procedure Reviews

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ORAUT-OTIB-0093

- Title: Conversion of Committed Effective Dose to Annual Organ Dose
  - Revision 00 issued October 16, 2023
- November 2023 SC&A was tasked to review
  - Review issued May 2024

Background

- Beginning January 1, 1996, internal dose evaluation programs at DOE facilities were required by 10 CFR Part 835 for radiological workers who, under typical conditions, were likely to receive 0.1 rem or more committed effective dose equivalent (CEDE) in a year
- CEDE is the risk-weighted sum of committed dose equivalents to tissue over the 50 years after an intake
- An amendment to 10 CFR Part 835 changed the dosimetric terms in the regulation to reflect the terminology in ICRP Publication 68
  - Full compliance with the 10 CFR Part 835 amendment was required by July 2010
- CEDE changed to Committed Effective Dose (CED), which is the sum of the committed equivalent doses to various tissues or organs in the body
- Some sites were in compliance prior to the 1996 and 2010 requirements

Scope

- DOE monitoring requirement based on 50-year dose to whole body
- EEOICPA requires annual organ dose
- Can not directly convert CED to annual organ dose
- NIOSH indicates they will use CED values to calculate and intake, which can then be used to calculate organ dose

Implementation

- The assignment of a 0.1 rem CED in each year of potential exposure provides a bounding estimate of internal dose for unmonitored workers
- To determine the intake (Bq) that would result in a CED of 0.1 rem (0.001 Sv), OTIB-0093 uses the following equation:

$$\text{Intake} = 0.001\ \text{Sv} / \text{DCF}$$

  - Dose Conversion Factors (DCF) in Sv/Bq are available in ICRP 119
  - All possible material types should be considered
  - Intake can then be used to model annual organ doses

Exclusions

- Future application of this method as a bounding assumption for internal dose is dependent on site-specific information and is outside the scope of this review
- Approach cannot be used for:
  - special metal tritides,
  - insoluble Pu-238, and
  - Super S plutonium

Conclusions

- SC&A reviewed NIOSH's approach and found the methodology to be reasonable and consistent with current ICRP guidance
- SC&A had no findings or observations

Questions?