

NIOSH-OVER-0009

Skin Exposure

Report from the Subcommittee for Procedure Reviews (SCPR)

Presented to the
Advisory Board on Radiation and Worker Health
April 11, 2018
Oak Ridge, Tennessee

Overarching Issues

- Represents a categorization of observations/findings that arise during dose reconstruction reviews or technical guidance document reviews, which will impact numerous sites.
- NIOSH-OVER-0009 specifically addresses SC&A's concerns regarding the modeling of fine and large particle deposition on the skin.

Concern 1: Concerns Related to NIOSH's Dose Model for Chronic Deposition of Fine Particles on Bare Skin (transferred to Overarching Issues by the SCDRR)

- SC&A's concern involved a derived dose of 16 mrem/year to bare skin that is based on unsupported and unrealistic assumptions, which include the following:
 - 1) Daily skin contaminations for each of the 250 workdays per year that only persist for 8 hours
 - 2) Implication that after 8 hours, each skin contamination is 100% removed by a standard daily shower
 - 3) Only bare skin is subject to contamination and resultant radiation exposure
- NIOSH discussed its approach for addressing fine particle deposition to the satisfaction of SC&A, except for assumptions regarding the ease with which uranium could be removed from skin and clothing.
- NIOSH prepared a white paper (February 2015), which assessed the literature for articles that qualitatively and quantitatively supported the removal of uranium by washing with soap and water.
- *Resolution as of February 18, 2015: SC&A and the SCPR found NIOSH's conclusions acceptable, and the SCPR closed this concern.*

Concern 2: Concerns Related to How IREP Derives Probability of Causation (POC) and Its Relevance to How Dose Is Assigned (transferred to Overarching Issues by the SCDRR)

- SC&A's concern involved the relationship between the derived dose and how IREP uses this dose to derive a POC, given that the skin dose only occurs to a small area.
- The IREP issue was discussed at the 07/18/13, 11/07/13, and 04/16/14 SCPR teleconferences. To satisfy SC&A's concern, NIOSH did the following:
 - Provided an explanation of the relationship between derived dose and IREP to determine a POC.
 - Identified that specific guidance for dealing with non-uniform exposure to the skin has been incorporated into OTIB-0017.
 - Consulted with SENES to confirm OTIB-0017 guidance was appropriate.
- SC&A and the SCPR concurred with this response.
- *Resolution as of April 16, 2014: The SCPR closed this concern.*

Concern 3: Concerns Related to NIOSH's Dose Model for Large Uranium Flakes on Skin (transferred to Overarching Issues by the SCDRR)

- SC&A had the same basic questions as described in Concern 1, but for deriving doses for the skin deposition of large uranium flakes.
- The large uranium flake issue was discussed at the 07/18/13, 11/07/13, and 04/14/16 SCPR teleconferences. SC&A recommended using OTIB-0017 protocols, where the skin exposure under a hypothetical flake is averaged over the entire surface area of the body.
- NIOSH and the SCPR concurred with this response.
- *Resolution as of April 14, 2016: The SCPR closed this concern.*

Questions?