

***Savannah River Site
SEC Petition Evaluation Report Review
Status Report***

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Advisory Board on Radiation and Worker Health
Augusta, Georgia
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Remaining Key Work Group Issues

Ongoing Review (post-September 1972):

- Neptunium-237
- Thorium
- Overall CTW to NCW internal dose comparison
- Subcontractor database validation

Other Open Issues, including:

- Recycled uranium
- Coworker model to be reviewed:
 - Trivalent actinides, Am, Cm, Cf
 - Fission and activation products
 - Co-60
- Tritium/tritides
- Exotic radionuclides
- Internal dose due to incidents

SC&A Review Activities

- Onsite Data Captures and Interviews:
 - June 2013: Interview of crafts and construction workers
 - August 2013: Joint NIOSH/SC&A data capture and interviews
 - November 2013: Joint NIOSH/SC&A data capture and interviews
- Ongoing SRS Document Reviews
- Work Group/NIOSH/SC&A Technical Calls
- Work Group Calls/Meetings:
 - February 5 and February 26, 2014 (neptunium and thorium)
 - September 26, 2013, and April 7, 2014 [OPOS (One person-One sample)]

Neptunium – Issue Status

- NIOSH Developed Coworker Model for Np-237 (ORAU-RPRT-0056, 2012)
 - Proposes to use data for all workers based on conclusion that dose distributions of CTW and NCW workers were the same
 - Proposes dose estimation methods for Np-237
- SC&A Provided Comments in July 2013 Review to which NIOSH Responded in January 2014:
 - Findings 1–8 question CTW/NCW comparison and express concerns over OPOS
 - Issues included whether both groups were monitored in same manner (or needed to be), statistical validity, minimum sampling size, and sample dominance
 - Findings 9–19 address specific methods for Np-237 dose estimation
 - Issues included use of chest vs. whole body geometry, whether 86.5 keV photons suitable for estimating Np-237, how whole body counts and urinalysis results actually compare, assumptions made about intake dates, and rationale for sharp discontinuities in observed in-vivo based intake rates for Np-237

Neptunium – Work Group Actions

Work Group Meeting Call (February 26, 2014):

- Findings 1–8 of SC&A report address aspects devolving to comparability of CW:NCW — *deferred to SEC Work Group for OPOS discussion*
- Findings 9–19 address various concerns over current Np-237 dose estimation approach based on available bioassay data – *NIOSH agreed to conduct additional comparative analysis of bioassay data and review new Np/Pu concentration ratio data for possible application*

Thorium – Issue Status

- NIOSH Issued Addendum #3 to ER Addressing Thorium (post-1972); Presented at the December 2012 Advisory Board Meeting, Knoxville
 - Addendum #3 concludes dose reconstruction feasible for thorium, 1972–2007, because of very low inventory, minimal use, process knowledge, radiological controls, and availability of alternate bioassay data (Am, Cm, Cf)
- SC&A Provided Comments in September 2013 Review to which NIOSH Responded in January 2014:
 - Concerns over adequacy and completeness of NIOSH’s source term description (time and place); while NIOSH expanded Table 5-1, SC&A has issues with basis for table and its implementation
 - Questions regarding monitoring configuration at tank farms to support bounding model for thoron exposure
 - Concerns over wide variability observed in individual urine sample counts for thorium
 - Other issues were deferred to SEC Work Group (OPOS-related), required provision of additional information, or were closed (e.g., chelation-related data not to be used)

Thorium – Work Group Actions

Work Group Meeting Call (February 26, 2014):

- SC&A to prepare analysis of expanded Table 5-1 of OTIB-0081 used to identify SRS workers potentially exposed to thorium
- NIOSH to provide report of DAC-based approach to bound thorium doses after January 1, 1990
- NIOSH to obtain additional air sampling measurements for SRS tank farm to develop facility-specific bounding dose for thoron
- NIOSH to investigate derivation of coworker intakes for thorium given observed wide variability of counts for same urinalysis sample
- Issues related to CTW:NCW comparisons deferred to OPOS discussion

Overall CTW to NCW Internal Dose Comparison – SEC Work Group Deliberations

- ORAUT-RPRT-0053 (2012) introduced one person-one sample (OPOS) methodology as alternative to existing pooled-data approach for coworker models. Addresses problems of “data dominance” and correlation.
- General approach has specific application to SRS (e.g., Np and Th), but does not ameliorate concern over differences in CTW:NCW monitoring
- SC&A provided initial response to RPRT-0053, and more detailed response in September 2013 and Work Group presentation in April 2014:
 - SC&A concludes that use of OPOS on fixed-period basis is not scientifically justified based on review of data dominance and correlation at SRS and Fernald, and statistical validity
 - Should only be used where clear evidence of data dominance is present due to spike in samples from incident(s)
- NIOSH response (January 2014) and Work Group presentation (April 2014) dispute SC&A findings; will issue written response on presented SC&A issues

Subcontractor Database Validation

Issue:

Subcontractor dose records maintained in “company” hardcopy files prior to being migrated to electronic databases being used for dose reconstruction.

Questions:

- How complete were company files for various subcontractor tiers (i.e., company names, personnel identifiers)?
- Was all relevant information migrated to SRS electronic databases?

Work Group Action:

- Explore options to address these questions
- As a first step, NIOSH is reviewing NOCTS for claimants who were subcontractors and comparing with SRS electronic records