



SC&A Review of SEC-00250 Evaluation Report for the Y-12 Plant

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To the Advisory Board on Radiation and
Worker Health, Y-12 Work Group

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Background

- ◆ Presented to the Advisory Board on August 21, 2019
 - NIOSH evaluated class: January 1977–December 1994
 - Recommended (and accepted) class: January 1977–July 1979
 - Class not recommended: August 1979–December 1986
 - Reserved period: January 1987–December 1994
- ◆ Basis for recommended class: Infeasible to reconstruct thorium exposure

SC&A review approach

- ◆ Is dose reconstruction to unmonitored workers feasible?
- ◆ Evaluate available thorium data and information against established co-exposure criteria:
 - Completeness
 - Adequacy
 - Representativeness
- ◆ Additional concern regarding uranium exposures to machinists
- ◆ What about other sources?

Thorium processing documentation

- ◆ Affirms that large-scale thorium work ended in the 1970s (before evaluated period)
- ◆ Captured documents lack information about later smaller scale projects (Observation 1)
 - Worker names
 - Thorium processing locations
 - Duration of activities

Thorium monitoring data completeness

- ◆ Compare quarterly health physics reports that tabulate the number of in vivo counts performed
- ◆ Only available up to September 1981, when reporting practices changed (Finding 1)
- ◆ Limited evaluation showed 95% of the reported data are available for co-exposure analysis
- ◆ Additional in vivo data may be available that were not considered due to monitoring “type” designation (Observation 4)

Comparison to thorium processing

- ◆ How much thorium was in process compared to the amount of monitoring data we have in hand?
- ◆ Information on the annual throughput is currently unavailable
- ◆ Evidence suggests that information is available but likely redacted (Finding 2)

Thorium data adequacy

- ◆ Is the analytical method effective?
- ◆ In vivo methods to monitor for thorium are identical to other EEOICPA sites previously evaluated
- ◆ Mobile In Vivo Radiation Monitoring Laboratory (MIVRML)
 - developed at Y-12
 - used at the Fernald site and elsewhere (Observation 2)
- ◆ Potential for bias in the measured data as found during the Fernald SEC-00046 (Observation 3)

Thorium data representativeness

- ◆ Who was monitored?
 - Review job title information for monitored claimants
 - Analyze department codes for monitored workers
- ◆ No specific trends were observed
- ◆ SC&A concludes the monitoring program reflects “routine, representative” sampling rather than “targeted” as defined in the co-exposure guidelines (Observations 5 and 6)

Uranium data summary

- ◆ How complete is the uranium data overall?
- ◆ SC&A comparison of health physics reports and available co-exposure urinalysis data:
 - Range by year was 75%–121%
 - 98.4% completeness overall (Observation 7)
- ◆ No data to evaluate representativeness (Finding 3)
- ◆ In vivo monitoring for uranium is not addressed (Observation 8)

Uranium data for machinists

- ◆ Is the uranium monitoring program adequate for machinists?
- ◆ Review of claimant population:
 - 236 claims designated as “machinist”
 - 47% were monitored internally for uranium (while also wearing a dosimeter)
- ◆ What about dose reconstruction (Observation 10)?
 - 51% would not require co-exposure assignment
 - 24% would require partial co-exposure assignment
 - 25% would require co-exposure assignment for entire employment

Exposure potential for machinists

- ◆ Compare airborne contamination data for uranium operations
 - Metal fabrication: machining operations
 - Metal preparation type a: chemical processes, casting operations, rolling and forming
 - Metal preparation type b: chemical recovery processes
- ◆ Metal preparation categories were consistently bounding of fabrication activities
- ◆ SC&A conclusion: Metal preparation workers likely bound metal fabrication done by machinists (Observation 9)

Other sources of exposure

- ◆ Discussed in SC&A review of ORAUT-RPRT-0090, “Monitoring Feasibility Evaluation for Exotic Radionuclides Produced by the Oak Ridge National Laboratory Isotopes Division” (Observation 11)
- ◆ Specific to Y-12: Pu-241 exposures not addressed (Finding 4)
- ◆ Post-production activities after 1983 (D&D) not addressed (Observation 12)



Questions?