



# Update on SEC-00250 Evaluation Report for the Y-12 Plant

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To the Advisory Board on Radiation and  
Worker Health

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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
- ◆ Work group met in September 2020

# 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 (already evaluated, e.g., Fernald)
- ◆ 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)
  - Based on statements made by NIOSH in ORAUT-RPRT-0090 specifically concerning Y-12
  - September 2020 work group update: NIOSH concluded no infeasibility due to monitoring data for Pu-241 available starting in 1967
- ◆ Post-production activities after 1983 (D&D) not addressed (Observation 12)

# Ongoing evaluation activities and path forward

- ◆ Co-exposure models to be updated with current methods and guidance to address SC&A's findings and observations
- ◆ NIOSH/ORAUT, in conjunction with SC&A, performed 12 telephone interviews with former workers in August, October, and November 2020 (6 additional interviews were attempted but communications were unsuccessful)
  - Notes from the interviews are currently undergoing classification review
  - Next step: consolidate notes into a summary and confirm accuracy with the interviewees
- ◆ NIOSH continues to evaluate thorium source term for 1987–1994 (addendum report for SEC-00250)
- ◆ NIOSH to re-baseline remaining technical issues from 2005–2008



# Questions?