

# **PANTEX SEC PETITION REVIEW**

(Remaining years: 1951–1957, 1984–1991)

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Advisory Board on Radiation and Worker Health  
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## WORK GROUP REVIEW: OVERVIEW

- November 20, 2007: Petition qualified
- August 8, 2008: NIOSH Evaluation Report issued
- October 20, 2011: ABRWH recommendation of SEC for 1958–1983
  - “NIOSH lacked adequate information necessary to complete individual [DRs] with sufficient accuracy for internal radiological exposures due to uranium...”
  - However, NIOSH believed it could bound uranium exposures in 1984–1989, during W28 system dismantlement using 1990 bioassay data
- January 2012: NIOSH issues white paper (Bihl and LaBone) providing dose reconstruction (DR) method for 1984–1989
  - NIOSH seeks additional W28 worker access information for start dates for disassembly
  - SC&A reviews NIOSH white paper, holds technical conference call, conducts site data capture
- June 18, 2013: Work Group meeting on remaining SEC issues

## REMAINING SEC ISSUES

- **Uranium, 1951–1957:** Presence of weapons system uranium sources with exposure potential during handling
- **Uranium, 1984–1989:** Feasibility of DR based on proposed NIOSH method (assumed bounding intakes; Bihl and LaBone 2012)
- **Uranium, 1990–1991:** Feasibility of DR based on adequacy and completeness of uranium bioassay data
- **Thorium, 1984–1991:** Feasibility of DR based on proposed NIOSH method (mass ratio with uranium; Ruhter et al. 2011)

## URANIUM, 1951–1957

- SC&A confirmed no weapons system dismantlements before 1958
- Fresh DU forms handled, but no evidence of exposure potential
- Burn pits and hydroshot testing involved DU, but sufficient air sampling data exist upon which NIOSH can base DR
- *Work Group recommends acceptance of NIOSH's ability to reconstruct dose from uranium exposures*

## URANIUM, 1984–1989

- NIOSH paper (Bihl and LaBone 2012) presents set of assumed intakes derived from excretion values from lognormal analysis of 1990 uranium urinalyses for W28 workers involved in 1989 contamination incident
- Five different intake timing assumptions used to define exposure scenarios from which bounding intake can be postulated; SC&A raised concerns over uncertainties involved
- Work Group discussion led to conclusion that proposed method may not reflect all sources of uranium exposure at Pantex, or when they may have occurred (including possible enriched uranium sources)
- *Work Group recommends an SEC be considered for all employees at Pantex for 1984–1989 based on the lack of a feasible method to reconstruct uranium exposures with sufficient accuracy*

## URANIUM, 1990–1991

- Following 1989 uranium contamination event on W28 disassembly line, Pantex initiated routine bioassay program with 431 and 239 workers enrolled in 1991 and 1992, respectively
- The year 1990 was a transition year, with bioassay data for 46 workers (essentially follow-up from 1989 incident)
- SC&A validated ER finding of adequate bioassay data in routine bioassay program; noted 1990 as transition year at Work Group meeting
- *Work Group recommends an SEC be considered for 1990 based on insufficient bioassay data to support DR with sufficient accuracy (and recommends acceptance of NIOSH's ability to reconstruct doses from uranium exposures for 1991)*

## THORIUM, 1984–1991

- Ruhter et al., 2011 assumes chronic intake of thorium pegged at 2% of DU intake for times when thorium is present with uranium in disassembly
- Based on mass ratio intake values derived from 1996 air samples taken during W55 disassembly (considered “worst” thorium-containing weapons system)
- Applied retrospectively to 1984–1991, assuming thorium disassembly was “cleaner” due to fewer disassemblies and less time since fabrication for oxidation, and engineering safeguards were “largely unchanged”
- SC&A questioned the validity of these assumptions, particularly with installation of gloveboxed downdraft table for W55 disassembly in late 1991, which brought into question representativeness of 1996 mass ratio proposed for the pre-1992 period
- Uranium and thorium contamination likely varied between individual W55 units
- *Work Group recommends SEC be considered for all employees at Pantex for 1991 based on lack of feasible method to reconstruct thorium exposures with sufficient accuracy (1984–1990 period subsumed by uranium SEC recommendations; thorium DR relies upon mass ratio with uranium, which Work Group finds infeasible for 1984–1990).*

## SITE PROFILE ISSUES: STATUS

1. Adequacy of Internal Dose Records – Closed at June 2013 WG
  2. Internal Dose Models for Uranium – Closed at June 2013 WG
  3. Dose Estimate Approach for Plutonium – Closed
  4. Dose Estimate Approach for Thorium – Closed at June 2013 WG
  5. Internal Dose Approach for Metal Tritides – Closed
  6. Interpretation of External Dosimetry Data\* – NIOSH and SC&A to finalize/close
  7. Neutron-to-Photon Ratio Not Bounding – NIOSH and SC&A to finalize/close
  8. Completeness of Exposure Sources\* – NIOSH and SC&A to finalize/close
  9. Incidents Cited Limited, Incomplete\* – NIOSH and SC&A to finalize/close
- (\* encompassed by SC&A white paper/NIOSH response)

## SITE PROFILE ISSUES: STATUS (cont'd)

10. Inadequate Consideration Given to Firing Sites – Closed at June 2013 WG
11. Validation Whether Most Exposed Workers Badged – Closed
12. Accuracy of Plant Exposure Data (Petitioner Issue) – Closed
13. Too Few Workers Monitored for Valid Dose Reconstruction (petitioner issue)\* – NIOSH and SC&A to respond
14. Records Incomplete for Subcontractors, Temps, Short-term Employees (petitioner issue) – Closed
15. Exposure from Tritium Leaks (petitioner issue)\* – NIOSH and SC&A to finalize/close
16. Badge Placement (petitioner issue) – NIOSH to follow up
17. Efficacy of HP and IH Programs (petitioner issue) – Merged with Other Matrix Issues – Closed at June 2013 WG

(\* encompassed by SC&A white paper/NIOSH response)

# SUMMARY

- Work Group recommends full Advisory Board review and action regarding dose reconstructability of worker exposure at Pantex for:
  - **Uranium** from 1984 through 1990, where an exposure potential existed with the disassembly of the W28
  - **Thorium** during 1991, where an exposure potential existed with the disassembly of the W55
- Work Group recommends acceptance of NIOSH's ability to reconstruct uranium exposures from 1951 through 1957, as provided in the Evaluation Report for SEC-0068, Pantex Plant
- Completes remaining SEC issues for petition period
- Work Group will continue to focus on resolving remaining site profile issues