



Review of NIOSH White Paper: “Assessment of Certain Special Exposure Cohort- Related Issues for the Hanford Site”

Joe Fitzgerald
Ron Buchanan

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Worker Health, Hanford Work Group

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Background

- ◆ Original SEC petition SEC-00057 qualified for Jan. 1, 1942–Dec. 31, 1990; series of classes added, final ones in response to 83.14 petition for all Hanford workers, July 1, 1972–Dec. 31, 1983 (SEC-00201), and another for named prime contractors for Jan. 1, 1984–Dec. 31, 1990 (SEC-00226)
- ◆ Remaining group to be evaluated are employees of prime operating contractors excluded in SEC-00226, for 1984–1990
- ◆ White paper issued Jan. 7, 2020, to WG on January 8
- ◆ Provides status of NIOSH assessment for SEC-00226 of dose assessment feasibility for remaining SEC-related issues based on additional site research conducted in 2017–2019

Hanford white paper: Conclusions

OVERALL: NIOSH has found “nothing contrary to the determination made in SEC-00201 ER that dose reconstruction was feasible from 1984 onward for employees of the prime contractor organizations, as defined in the SEC-00226 class definition.”

- ◆ **Radionuclides of concern (ROC):** No evidence of large-scale use of ROCs or any cases of “potential chronic source of intake.”
- ◆ **Lack of monitoring data for non-chronic sources:** Does not equate to dose reconstruction infeasibility. Conversely, existence of nuclide-specific data indicates that a radiological incident occurred. Minor incidents were not significant internal dose contributors.
- ◆ **Programmatic incident reporting:** “Appropriate bioassay methods were available for all ROCs and were used when needed.”
- ◆ **Workplace monitoring:** “Backstopped” by routine bioassay program.

SC&A's Hanford evaluation focus (1984–1990)

Review for resolution of remaining Board Review System issues:

- ◆ **Key ROC:** Source term/potential exposure
 - Th-232 (issue 3)
 - HEU (issue 4)
 - U-233 (issue 7)
 - Np-237 (issue 9)

- ◆ **Programmatic issues:** Exposure sources/adequacy of monitoring
 - Special tritium compounds (issue 10): Any operational sources?
 - Skin contamination at N Reactor (issue 20): Adequate monitoring and records?
 - Minor radiological incidents (issue 22): Sufficient followup and bioassays?
 - Building 324 leaks (issue 27): Adequacy and completeness of internal monitoring data?

Review of data adequacy and completeness

- ◆ Review of Hanford internal dosimetry program practices, 1983–1990
- ◆ Review of REX internal monitoring database for prime contractors



Preliminary SC&A Status

Issue 3

Issue 4

Issue 7

Issue 9

Issue 10

Issue 20

Issue 22

Issue 27

Thorium-232 (issue 3)

- ◆ **Issue:** Potential thorium exposures during remediation, use of thorium in fuel fabrication in 300 Area, and possible use of thorium in other Hanford areas.
- ◆ **SC&A:** Agree no evidence of process use and operations involving Th-232 in 1984–1990, and no incidents involving intakes
 - **Basis:** Review of SRDB documentation (including interviews), review of Nuclear Materials Management and Safeguards System (NMMSS) database, review of incident reports, review of internal dose database

Highly enriched uranium (issue 4)

- ◆ **Issue:** HEU sources with associated potential worker exposures.
- ◆ **SC&A:** Questions whether NIOSH has sufficiently confirmed lack of operations involving HEU in 308 Building given that it is “unknown how frequently [such] operations involving enriched uranium took place.” However, SC&A agrees that routine bioassays would have presumably detected U-235 intakes.
 - **Basis:** Review of SRDB documentation, review of NMMSS database, review of incident reports, review of internal dose database

Uranium-233 (issue 7)

- ◆ **Issue:** Possible sources of Np-237 intakes at Hanford.
- ◆ **SC&A:** Questions whether NIOSH investigated scrap solutions of U-233 in Plutonium Finishing Plant and possible applications in experimental work in 300 Area (identified previously by SC&A).
 - NIOSH responses on this issue have been general, not specific to these SC&A lines of inquiry.
 - SC&A does not dispute that NIOSH's review was broad, including interviews, area-specific records, and material control and accountability records.

Neptunium-237 (issue 9)

- ◆ **Issue:** Possible sources of Np-237 intakes at Hanford for 1984–1990.
- ◆ **SC&A:** Agrees no evidence of potential chronic intakes of purified Np-237 in Hanford operations, with incidents limited to one in 1989 involving chemical separations work for neptunium dosimeters from the MIP test (with adequate bioassay followup).
 - **Basis:** Review of SRDB documentation, review of NMMSS database, review of incident reports, review of internal dose database

Special tritium compounds (issue 10)

- ◆ **Issue:** Site profile citation that metal tritides (“Special Tritium Compounds”) potentially present as part of Tritium Target Program beginning in 1988.
- ◆ **SC&A:** Agrees that no evidence of post-irradiation examinations of irradiated tritium target rods took place at Hanford in 1984–1990. Any other potential exposures to STCs can be addressed by NIOSH if an exposure source identified.
 - **Basis:** Review of SRDB documentation

Skin contamination at N Reactor (issue 20)

- ◆ **Issue:** Whether skin contaminations at N Reactor were adequately monitored and recorded in 1984–1990.
- ◆ **SC&A:** Agree that formal documentation of skin contamination cases at N Reactor was in place prior to 1984 and was followed until N Reactor ceased operation in 1987. Information from skin contamination forms can be used, as necessary, to estimate a skin dose.
 - **Basis:** SRDB documentation

Internal monitoring associated with minor radiological incidents (issue 22)

- ◆ **Issue:** Whether sufficient bioassays were taken to account for potential worker exposures from minor radiological incidents during 1984–1990.
- ◆ **SC&A:** Agree that by the 1980s, contractor radiological incident reporting appears to be comprehensive and effectively implemented, beyond just the more serious events.
 - **Basis:** SRDB incident reports and interviews

Building 324 leaks (issue 27)

- ◆ **Issue:** Adequacy and completeness of internal monitoring data for workers who may have been affected by radiochemical-cell leakage incidents that occurred in 324 Building.
- ◆ **SC&A:** SC&A is investigating this issue and will address it in our draft report.

Data adequacy and completeness

- ◆ NIOSH used various in vitro and in vivo bioassay data when addressing the remaining Hanford issues in their Jan. 7, 2020, white paper.
- ◆ SC&A is currently evaluating the adequacy and completeness of these bioassay data using the REX, SRDB, and NOCTS databases.
- ◆ SC&A will summarize results of evaluation in its draft report.



Questions?