

Evaluation of Savannah River Site Subcontractor Bioassay Data Completeness

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Background

- SC&A tasked in Sept. 2016 to conduct broad-based sampling review of bioassay data completeness at SRS for subcontractor trade workers (CTWs).
- Adequacy and completeness of such databases are a cornerstone of dose reconstruction, particularly where coworker models are necessary.
- Question arose from interview with SRS employee, who indicated subcontractor records were maintained separately before they were merged into current SRS electronic database.

Approach

- Identified available Radiation Work Permits (RWPs) for subcontractor CTWs as means to determine if corresponding job-specific bioassay results can be located in SRS records
- Broad scope – survey across variety of facilities, operations, and timeframes (1972–1995)
- RWPs identified for 1982–1995, with majority of records for 1989–1995 (corresponds with Westinghouse’s early tenure as operating contractor)
- Onsite matching of 306 identified subcontractor CTWs with SRS bioassay records: electronic, fiche, hardfile
- Bioassay matching using 30- and 90-day “grace” periods following RWP job date

Subcontractor CTWs

- Electricians
- Pipefitters
- Painters
- Construction workers
- Laborers
- Riggers
- Millwrights
- Carpenters
- Sheetmetal workers
- Boilermakers

Survey Experience

- RWPs found to be scarce and lacking uniformity; only 13 permits identified through searches for 1972–1995.
- Some RWPs, e.g., signup sheets, lacked explicit bioassay checkoffs; others did not clearly identify radiological hazard.
- Subcontractors identifiable by payroll code, company name.
- For 243 subcontractors that had bioassay results within 90 days, target radionuclides: tritium (75%), Pu (20%), other (5%).

Results: Completeness of Records

- Missing records: 5/324 (1.5% missing)
- Total RWPs
 - 30 days: 105/306 for 66% completeness (34% missing)
 - 90 days: 62/306 for 80% completeness (20% missing)
- RWPs with explicit bioassay requirement
 - 30 days: 57/197 for 71% completeness (29% missing)
 - 90 days: 31/197 for 84% completeness (16% missing)

1998 Notice of Violation (NOV)

- WSRC cited under 10 CFR 820 for “deficient work processes with respect to full worker adherence to established WSRC bioassay requirements.” (Action under 10 CFR 835 deferred.)
- WSRC self-surveys found worker non-participation in job-specific bioassays:
 - 1995: 67% non-participation (limited sample)
 - 1997: 79% non-participation (all workers in 2nd quarter)
- Corrective actions: worker tracking/logging, procedure rewrites, training, uniform RWP forms – completed Dec. 1998. (Resampling of 1997 missing CTWs showed no measurable intakes.)
- Has important implications for CTW bioassay completion question; NIOSH conducting further investigation.

Conclusions

- SC&A concludes bioassay dataset for subcontractor CTWs is demonstrably incomplete for 1989–1995 based on 16–34% missing results, as well as NOV findings of CTW non-participation in 1998. (NIOSH is determining whether non-participation equates to missing data for 1995–1998.)
- However, NIOSH has indicated that this range of incompleteness may be acceptable based on other considerations – ultimately, how “complete is complete” judgment needed.