

ORAUT-OTIB-0052

Parameters to Consider When Processing Claims for Construction Trade Workers

Report from the Subcommittee for Procedure Reviews (SCPR)

Presented to the
Advisory Board on Radiation and Worker Health
Redondo Beach, California
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ORAUT-OTIB-0052, “Parameters to Consider When Processing Claims for Construction Trade Workers”

- ORAUT-OTIB-0052 provides guidance for performing dose reconstructions for unmonitored construction trade workers (CTWs)
- Revision 00, August 31, 2006
 - SC&A review of Revision 00, June 6, 2006
 - Identified 16 findings
 - 5 closed during June 24, 2008, meeting
- Revision 01, February 11, 2011
 - SC&A review of Revision 01 (focusing on remaining findings), July 2011
- Revision 02, July 24, 2014

Finding 1: OTIB-0052 does not address differences in doses received by different construction occupations.

- It was determined that this finding issue was addressed by Finding 16, so it was combined with that finding.
 - The SCPR transferred Finding 16 (and by extension Finding 1) to OTIB-0020.
 - On November 14, 2011, NIOSH issued OTIB-0020, Revision 03, with the requested change to address the OTIB-0052 findings.
- *Resolution: In April 2012, the SCPR was satisfied with the change and closed this finding along with Finding 16.*

Finding 2: The dose databases used are lacking significant data for the early operational years.

- NIOSH concurs with SC&A's postulation that a reason for relatively low CTW exposure during the early years of site operations is that the CTWs would more likely be involved with **initial facility construction** rather than **retrofits**. This would involve **less radiation dose potential**. Any deficiency in data during early operational years would apply to all monitored workers, not just CTWs, and would therefore tend to be an unbiased source of uncertainty.
- *Resolution: The SCPR was satisfied with this response and closed the finding in June 2008.*

Finding 3: The dose databases do not always identify who were CTWs, and for CTWs, what were their occupations.

- NIOSH response:
 - The dose databases constitute the **best available source of information** for a large population (more than 179,000 bioassay values and 216,000 external dose data values for CTWs were included in the analysis).
 - The criteria used to identify CTWs were either **set at the time the record was created** by site personnel or were identified in the OTIB in a description of the database query.
- *Resolution: The SCPR was satisfied with this response and closed the finding in June 2008.*

Finding 4: NIOSH did not make modifications to the internal dose calculation methodology, as they indicated to the Center to Protect Workers' Rights (CPWR) that they would.

- NIOSH response:
 - The CPWR agreed-upon modifications (i.e., increase the geometric standard deviation) resulted in “implausibly large values.”
 - A better course of action was available based on actual CTW bioassay data rather than assumed intakes based on air concentration.
 - The resulting method is believed to provide a more site-specific-based approach to dose reconstruction that is favorable to the claimant.
- *Resolution: Based on NIOSH's response and comments during the August 2007 meeting, the SCPR closed the finding in June 2008.*

Finding 5: Plutonium and/or uranium were used to compare internal CTW to all monitored workers (AMW) doses. What about other radionuclides?

- NIOSH responded that the vast majority of bioassay data in the DOE complex are for plutonium and uranium. Data on other radionuclides are limited in timeframe and number of results. Consequently, meaningful comparisons between the groups for less prominent radionuclides were not judged to be feasible.
- SC&A was not satisfied with NIOSH's response and asked a series of follow-up questions.
- NIOSH proposed changes to OTIB-0052 to satisfy SC&A's concerns.
- NIOSH issued Revision 01 in February 2011, and SC&A reviewed the document.
- *Resolution: Based on the change made by NIOSH in Revision 01 regarding this issue and SC&A's concurrence, the Subcommittee closed this issue in July 2011.*

Finding 6: OTIB-0052 does not address how to determine CTW doses at sites that do not have a coworker model.

- NIOSH response:
 - For sites lacking coworker studies, the dose for unmonitored CTWs is reconstructed in the same way as for other unmonitored workers with a potential for exposure or intakes (See Section 8.1 in OTIB-0052).
 - The site technical basis document provides direction on how to assign external and internal doses, and then the appropriate adjustment factor defined in OTIB-0052 is applied.
- *Resolution: SC&A and the SCPR were satisfied with this response, and the SCPR closed the finding in June 2008.*

Finding 7: Does not address how to determine neutron CTW doses.

- NIOSH response:
 - External doses were not intentionally differentiated according to gamma or neutron doses, so no inherent bias in reconstruction of neutron dose is likely.
 - Note that neutron dose is normally associated with access to special nuclear materials, which requires a security clearance or security escort.
 - Workers with security clearances were known and likely to be monitored. Consequently, it is reasonable to assume that the neutron dose would be higher in the group of all monitored workers than in the somewhat more transient CTW group.
- Resolution: *SC&A and the SCPR were satisfied with this response, and the SCPR closed the finding in June 2008.*

Finding 8: All Savannah River Site (SRS) external doses are from the HPAREH. NIOSH needs to evaluate other dose databases, e.g., Fayerweather, SRS-ABST.

- NIOSH response:
 - No additional value is gained in this case by expending resources to study the contents of other, less complete, databases.
 - There is no reason to believe that including the Fayerweather database in the ORAUT-OTIB-0052 analysis would change the results of that study for the SRS or for the ratio of 1.4 to be applied to external coworker models.
- Resolution: *SC&A and the SCPR were satisfied with this response, and the SCPR closed the finding in August 2008.*

Finding 9: Evaluation is based on DOE annual exposure report. NIOSH needs to address the Master Update Dump (MUD) dose database for Idaho National Laboratory (INL).

- NIOSH responded that the MUD database covers the time period prior to 1986. The data in the Annual Reports is equivalent (because the Annual Report was created from the MUD data) for the overlapping time periods.
- SC&A disagreed with NIOSH's response and presented evidence showing that the data are not equivalent.
- NIOSH presented its proposed changes to ORAUT-OTIB-0052 to address this issue.
- NIOSH issued Revision 01 in February 2011, and SC&A reviewed the document.
- *Resolution: Based on the change made by NIOSH in Revision 01 regarding this issue and SC&A's concurrence, the Subcommittee closed this issue in July 2011.*

Finding 10: For post-1974, the ratio of penetrating doses experienced by CTWs to other workers in OTIB-0052 does not agree with the INL epidemiologic study (NIOSH 2005), which indicates a correction factor closer to 2, and perhaps greater for some job types.

- NIOSH responded that the **unmonitored CTW** at INL **would not have worked in a radiation area**, so assigning the CTW a dose equal to 1.4 times the non-CTW dose would be very claimant favorable.
- SC&A **disagreed** and requested additional information.
- NIOSH presented its proposed changes to OTIB-0052 to address this issue.
- NIOSH issued Revision 01 in February 2011, and SC&A reviewed the document.
 - NIOSH **added a new paragraph** to Section 5.13 that explains that the NIOSH 2005 data were not used, because the service workers are grouped with CTWs, a practice that is inconsistent with the approach taken in OTIB-0052.
- *Resolution: Based on the change made by NIOSH in Revision 01 regarding this issue and SC&A's concurrence, the Subcommittee closed this issue in July 2011.*

Finding 11: Claimant favorability of OTIB-0052 approach for INL early period internal dose (to 1965) cannot be determined.

- NIOSH explained that the reason pipefitters at SRS received higher doses during the 1960s was the **major modifications taking place in the F and H Canyons**. Since these are classified areas, all workers would have been monitored, and any unmonitored CTWs (the subjects of OTIB-0052) would have received lower exposures.
- SC&A presented evidence that led them to believe that the INL pre-1965 internal dose is **not well known** or documented.
- *Resolution: Based on the change made by NIOSH in Revision 01 regarding this issue and SC&A's concurrence, the Subcommittee closed this finding in July 2011.*

Finding 12: The REX dose database was not used. NIOSH needs to compare results based on the REX database to those given in OTIB-0052.

- NIOSH explained that electronic access to the REX database was not available when the report was drafted. However, the **data in REMS were derived from the data in REX** and are judged to adequately represent the ratio of CTW and AMW doses.
- SC&A explained that Section 6 of **OTIB-0052 needs to be revised** to indicate that the Hanford analysis was based on REX data provided by the site expert and not based on the references provided in the present version of Section 6.
- NIOSH presented its proposed changes to OTIB-0052 to address this issue.
- NIOSH issued Revision 01 in February 2011, and SC&A reviewed the document.
- *Resolution: Based on the change made by NIOSH in Revision 01 regarding this issue and SC&A's concurrence, the Subcommittee closed this finding in November 2014.*

Finding 13: The CTW doses need to be compared consistently to either AMW or non-CTWs. Currently, different sections perform different comparisons.

- NIOSH response:
 - Because CTW doses are similar to or higher than AMW doses, the calculated ratios, which are used to form an adjustment factor, tend to be similar or higher when non-CTW is used in the denominator instead of AMW.
 - The baseline method is to use AMW in the denominator, but the ratio would tend to be more favorable to the CTW population when non-CTW data are used in the denominator.
 - Regardless of comparison method, the outcome would be favorable to CTWs because the correction is typically applied to doses in a site-specific coworker model based on data for all monitored workers.
- SC&A examined the SRS HPAREH penetrating data from 1953 to 1999 and determined NIOSH's response was correct and recommended closure.
- *Resolution: The SCPR agreed with SC&A's recommendation and closed the finding in April 2012.*

Finding 14: The handling of “missing dose” needs to be consistent. Currently, some sections include “missing dose” while others do not.

- NIOSH explained that regardless of how missed dose was treated, the site-specific comparison between CTWs and AMW was fair because **missed dose was handled consistently** for both groups within each site.
- SC&A requested additional discussion on how the adjustment factors were selected and why dose ratios calculated using **different methodologies** can be compared.
- After extensive discussions, it was determined that **both Average Adjusted CTW to AMW ratios are less than the recommended correction** factor. In addition, NIOSH added appropriate wording to Section 4 of the OTIB.
- *Resolution: In July 2012, the SCPR closed the finding.*

Finding 15: No instructions are given for what to do if high or low cumulative exposures are suspected.

- NIOSH explained that the normal assessment **methods defined in OTIB-0020** for these types of exposures apply. The method in OTIB-0052 does not change when either low or high cumulative exposures are suspected.
- The SCPR agreed that OTIB-0020 was a better document to address this issue and transferred the finding to OTIB-0020.
- On November 14, 2011, NIOSH issued OTIB-0020, Revision 03, with the requested change to address the OTIB-0052 findings.
- *Resolution: In April 2012, the SCPR was satisfied that the change to OTIB-0020 addressed the OTIB-0052 concern and closed the finding.*

Finding 16: Some construction occupations (e.g., pipefitters) receive exposures larger than the average CTW exposure. The average member of such groups may consistently receive external exposures above the 95th percentile, but possibly not by much. Occupational details in the data are not plentiful enough to define percentile value.

- SC&A recommended that this issue be **transferred to OTIB-0020**, with a statement alerting the dose reconstructor that certain construction trades (e.g., pipefitters) may have received higher exposures than the CTW as a whole, and therefore, additional conservatism should be included in the dose reconstruction when the claimant belongs to one of these trades.
- The SCPR agreed that OTIB-0020 was a better document to address this issue and transferred the finding.
- On November 14, 2011, NIOSH issued OTIB-0020, Revision 03, with the requested change to address the OTIB-0052 findings.
- *Resolution: In April 2012, the SCPR was satisfied that the change to OTIB-0020 addressed the OTIB-0052 concern and closed the finding.*

Questions?