

OCAS-PER-014

Construction Trade Workers

Report from the Procedures Review Subcommittee

Presented to the
Advisory Board on Radiation and Worker Health
Redondo Beach, California

November 6, 2014

The PER Audit Process

As part of SC&A's support to the Advisory Board, each Program Evaluation Report (PER) is subject to a formal review, which includes the following five subtasks:

- Subtask 1: Assess NIOSH's evaluation of the "issue" and its potential impacts on dose reconstruction (DR).
- Subtask 2: Assess NIOSH's specific methods for corrective action.
- Subtask 3: Evaluate the PER's stated approach for identifying the universe of potentially affected DRs, and assess the criteria for identifying DRs requiring a re-evaluation of doses.
- Subtask 4 (2-Step Process): Recommend a number of DRs reworked as a result of the PER for SC&A's review, based on specific permutations defined in the PER. [A draft PER audit report is submitted to the Procedures Review Subcommittee (PRSC) and NIOSH for discussion/resolution of findings.] Thereafter, the Subcommittee selects cases for review, and SC&A conducts a focused audit of selected DRs.
- Subtask 5: SC&A prepares a supplemental report that contains the results of the review of DRs selected under Subtask 4.

OCAS-PER-014 Summary

- In 2004, it was determined that some Construction Trades Workers (CTWs) at various DOE sites may have been exposed to external/internal radiation, but were not monitored . CTWs include laborers, mechanics, masons, carpenters, electricians, painters, pipefitters, boilermakers, millwrights, sheetmetal workers, iron workers, insulators and others.
- To address this concern, ORAUT-OTIB-0052 (*Technical Information Bulletin: Parameters to Consider When Processing Claims for Construction Trades Workers*) was issued on 8/31/2006, and provided guidance on assessing radiation exposure to CTWs with inadequate monitoring.

OCAS-PER-014 Summary (Continued)

- OCAS-PER-014 was issued to re-evaluate claims at the following 10 sites where external coworker models had been issued prior to 8/31/2006 (i.e., OTIB-0052 publication date):
 - Hanford (internal coworker model also impacted)
 - Pacific Northwest National Laboratory (PNNL)
 - Kansas City Plant (KCP)
 - Los Alamos National Laboratory (LANL)
 - Pantex Plant (Pantex)
 - Portsmouth Gaseous Diffusion Plant (PGDP)
 - Savannah River Site (SRS)
 - Weldon Spring Plant (WSP)
 - Oak Ridge National Laboratory (X-10)
 - Y-12 National Security Complex (Y-12)

OCAS-PER-014 Summary (Continued)

- Four additional sites had external coworker studies published prior to OTIB-0052. However, claims at these sites had already been re-evaluated using current DR methodology (which included OTIB-0052) under other site-specific PERs. The four sites, along with their site-specific PERs, are listed below:
 - Paducah (OCAS-PER-013 issued 11/7/2008)
 - Rocky Flats (OCAS-PER-021 issued 8/17/2007)
 - Mallinckrodt (OCAS-PER-015 issued 7/31/2007)
 - K-25 (OCAS-PER-011 issued 9/26/2007)

OCAS-PER-014 Timeline

- 2004 – NIOSH identified that some CTWs at numerous DOE sites may have been exposed to radiation, but were not monitored
- August 31, 2006 – NIOSH issued ORAUT-OTIB-0052, *Parameters to Consider When Processing Claims for Construction Trades Workers*
- November 28, 2007 – NIOSH issued OCAS-PER-014, *Program Evaluation Plan: Construction Trades Workers*
- March 16, 2012 – SC&A submitted its draft review of OCAS-PER-014 (SCA-TR-PR2012-00014, Rev. 0)
- July 31, 2012; Feb. 13, 2014 – SC&A's six findings discussed and all findings resolved

Audit of OCAS-PER-014

Subtask 1: Assess Circumstances that Necessitated the Need for the PER

- During facility modification(s) and/or maintenance of major systems, CTWs may have been exposed, some of whom were not monitored for external and/or internal exposure.
- Exposures of CTWs may be different from other radiation workers and the assignment of coworker doses to unmonitored CTWs may not be claimant favorable.
- Empirical data ratios were developed from external and internal doses received by monitored CTWs to all monitored workers (AMWs) using data from seven major DOE sites [SRS, Rocky Flats, Y-12, K-25, X-10, INL, and Hanford]. Results of this assessment became the basis for NIOSH's ORAUT-OTIB-0052 guidance.

Subtask 1 (Continued): Assess Circumstances that Necessitated the Need for the PER

- External Dose. Using empirical data, NIOSH derived:
 - Deep dose coworker adjustment factor of 1.4.
 - Shallow dose was adequately bounded by AMWs' doses, and 95th percentile coworker data could be used without applying any adjustment factor.
- Internal Dose. Only Hanford coworker intake rates needed to be multiplied by a factor of 2. For all other sites, internal dose should be assessed using the same method that is applied to all other workers.

Subtask 1 Findings

#	Finding	Resolution
1 (Conditional*)	Deep-dose adjustment factor of 1.4 may not be claimant favorable if factor did not account for differences in exposure/employment periods in any given year between CTWs and AMWs.	NIOSH provided the spreadsheet showing that OTIB-0052 was based on Rocky Flats Plant data, and deep dose was adjusted for employment periods of less than a full year for both CTW and AMW groups.
2 (Conditional*)	Inclusion of CTWs among AMWs may obscure dose differences. OTIB-0052 states that sometimes the AMW group includes the CTWs and in others, it did not; however; OTIB does not identify which datasets (i.e., deep dose, shallow dose, and/or bioassay data sets) failed to separate CTW from AMW data.	The correction is applied to doses in a site-specific coworker model, which is based on data for all monitored workers. When CTWs are removed from the comparison, the ratio favors the CTW if the CTW doses are elevated. Also, the 20% threshold criteria for adjustment falls inside the margin of uncertainty (30%).
3 (Conditional*)	A shallow dose adjustment factor may be required if NIOSH failed to adjust CTW shallow doses to account for differences in employment/exposure periods between CTWs and AMWs in any given year.	NIOSH provided the spreadsheet showing that OTIB-0052 was based on Rocky Flats Plant data and shallow dose was adjusted for employment periods of less than a full year for both CTW and AMW groups.
4	DR guidance in OTIB-0052 for internal dose states “. . . the internal dose should be determined using the same method that is applied to all other workers.” In the absence of (1) internal monitoring data for the CTW and (2) coworker data, it is unclear what is meant by the recommendation.	This guidance means that the CTWs are treated no differently than other workers. The same criteria are used to determine potential for intake, and coworker values would be the same for all workers.

* A ‘conditional’ finding indicates that SC&A did not have access to original dose data (or an explanation that would clarify NIOSH’s assumptions) that would allow SC&A to determine if the data are accurate. This type of finding was established for efficiency purposes, when it is determined that a significant level of effort may be required to satisfy SC&A’s concern(s) that alternatively could easily be resolved by NIOSH during the resolution process.

Subtask 2: Assess Specific Methods for Corrective Action

- OCAS-PER-014 was prompted by the issuance of ORAUT-OTIB-0052, dated 8/31/2006, which requires multiplying external coworker dose by 1.4 for CTWs and, at Hanford, multiplying monitored worker's internal intakes by 2.0.
- Therefore, CTW claims at sites where external coworker studies have been issued prior to 8/31/2006 (as cited in Slide #4 above) must be re-evaluated.
- To identify all workers that may have been exposed as a member of a construction trade, NIOSH performed a search of NOCTS and original DR reports using 31 key words (listed in Attachment A of PER-014), resulting in the identification of 977 potentially affected claims.
- SC&A reviewed the list of sites with established coworker models and key word list and determined that NIOSH's screening methods appear sufficiently inclusive/complete. SC&A had no finding under the Subtask 2 review.

Subtask 3: Evaluate Approach for Identifying the Number of DRs Requiring Re-evaluation

- To determine if the 977 potentially affected claims needed a reworked DR, NIOSH applied the following screening criteria:
 - Confirm claim is a CTW, since key word search could not verify proper context.
 - Verify external coworker dose (or Hanford internal dose) was assigned in original DR.
 - Screen claims based on ability to raise POC to $\geq 45\%$ to ensure 30 IREP runs are performed, which would be triggered by an original POC of 36.8% or 29.0% at Hanford.
 - For claims with POC's less than trigger value, determine if any other PERs may increase dose.

Subtask 3 Findings

#	Finding	Resolution
5	<p>OCAS-PER-014 is incomplete. The extent to which NIOSH has screened and evaluated the universe of the 977 claims by means of the above-cited criteria was not discussed in the PER. As such, NIOSH has not identified the actual number of CTW claims (from among the 977 claims) that are eligible for the PER's dose adjustment factor(s) and a new DR.</p>	<p>The criteria for determining which claims NIOSH would request to be returned are not subjective, so it is unclear what value the totals add to the PER review. Nevertheless, NIOSH provided following:</p> <ul style="list-style-type: none"> 977 = total cases 52 = returned 620 = no return necessary 84 = returned prior to PER evaluation 221 = return requested for another PER
6 (Conditional)	<p>OCAS-PER-014 may be highly restrictive in addressing the problem of unmonitored CTWs. There is uncertainty about the fate of CTW claims that had been adjudicated before the issuance of a coworker model.</p>	<p>The finding assumes CTW DRs completed prior to a coworker model would have only included environmental and medical dose, but would now include a coworker dose. This is incorrect. Many claims were held for some time awaiting completion of a coworker model.</p>

Subtask 4: Recommend a Sample Set of Affected DRs for Re-evaluation

- Finding #5 above states NIOSH had not identified the number of cases (from 977 potential claims) that will require a reworked DR.
- Regardless of the final number of DRs requiring re-evaluation, SC&A recommended that 1 case be selected from each of the following 10 sites impacted by OCAS-PER-014:

Hanford

KCP

Pantex Plant

SRS

X-10

PNNL

LANL

PDGP

Weldon Spring Plant

Y-12

Timeline for SC&A's Subtask 4 (Case Audit) Report

- July 31, 2012 PRSC Meeting – SC&A tasked to review 1 case from each of the 10 sites impacted by OTIB-0052. Additionally, SC&A tasked to evaluate the applicable site TBDs and workbooks to ensure they were properly updated to incorporate OTIB-0052's CTW coworker recommendations. During SC&A's review, it was determined there were no reworked cases at 4 of the 10 sites. Therefore, SC&A's review for these 4 sites (i.e., KCP, Pantex, PNNL, Weldon Spring) was limited to verification that TBDs and workbooks had been updated.
- April 12, 2013 – SC&A submitted its draft Subtask 4 review (Draft SCA-PER-14, Subtask 4, Rev. 0).
- July 18, 2013, and November 7, 2013, PRSC Meetings – SC&A's findings discussed and all findings resolved.

Subtask 4: Review of Sample Set of DRs Affected by PER-014

SC&A received a list of the 977 claims potentially impacted with selection criteria applied. Using this list, SC&A generated the following two tables.

Selection Criteria Applied to Potentially Affected Cases

Result of Selection Criteria	Meaning of Designation	Cases Affected
No Return Necessary	NIOSH requested that the case NOT be returned for a new DR	620
Return Requested for Another PER	NIOSH requested the case be returned based on a different PER	221
Returned to NIOSH	NIOSH requested the case be returned for a new DR	52
Returned Prior to Evaluation	Case was returned to NIOSH prior to completing the PER evaluation	84
Total		977

Selection Criteria per Site

Site	Total Number of Claims	Returned to NIOSH	Return Requested for Another PER	Returned Prior to Evaluation	No Return Necessary
Hanford	166	14	80	14	58
PNNL	18	0	8	3	7
KCP	56	5	1	0	50
LANL	49	1	29	9	10
Pantex Plant	1	0	1	0	0
PGDP	112	4	2	4	102
SRS	162	5	61	29	67
Weldon Spring	19	1	1	0	17
X-10	159	10	41	28	80
Y-12	392	24	44	25	299

Subtask 4: Findings Associated with Execution of Selection Criteria

#	Finding	Resolution
7	SC&A found that many of the cases identified as requiring rework did not meet all requirements of the selection criteria. For example, 5 KCP cases were included in the set of 52 cases requiring rework. None of these five cases had a POC greater than the selection criteria of 36.8%; therefore, none of the five DRs were revised.	NIOSH stated that they review all potential cases <50% to determine if they are affected by another PER, etc., in order to rework all cases at a particular site at the same time.
8	SC&A noted that some cases were returned to NIOSH as a result of OCAS-PER-014; however, these cases were not revised.	NIOSH stated that not all cases are returned by DOL, since some are swept into a Special Exposure Cohort (SEC) or claimant has died and there is no survivor. Subcommittee determined that NIOSH cannot monitor what cases DOL returns and since all returned cases are reworked, the finding could be closed.

Subtask 4 Case Reviews

- SC&A performed an audit of 6 reworked cases; one from each of the following sites:
 - SRS
 - Portsmouth
 - Hanford
 - X-10
 - LANL
 - Y-12
- SC&A's review focused only on those doses impacted by OCAS-PER-014, namely assessing accuracy and correctness of coworker external doses, and for Hanford, both coworker external and internal doses were evaluated.

Subtask 4 Case Review Findings

#	Finding	Resolution
<p>9 (SRS); 10 (X-10, Y-12, K-25); 11 (Portsmouth); 16 (Hanford)</p>	<p>OTIB-0052 specifies that the 1.4 adjustment factor be applied to the measured coworker data at the site. However, missed and measured doses are reported in a single value for each percentile of coworker doses at these sites; therefore, an adjustment of 1.4 could not be applied directly.</p>	<p>NIOSH believes that this type of finding should have been and in the future should be handled during SC&A's review of the technical document (i.e., OTIB, etc.) implementing the change. SC&A agreed since, in this situation, we have adequate empirical evidence to show that the 1.4 adjustment factor was appropriately applied to missed and measured doses. The PRSC indicated that the finding should be closed.</p>
<p>12</p>	<p>SC&A questions whether NIOSH is planning on revising the one returned case for CTW coworker dose at LANL</p>	<p>DOL did not return this case to NIOSH, since the worker qualified for SEC status.</p>
<p>13</p>	<p>The CTW correction factor not applied to LANL coworker dose.</p>	<p>This worker had a job title on the list of CTWs; however, after reading the CATI Report, it was determined the claimant was an in-house employee, not a construction contractor.</p>

Subtask 4 Case Review Findings (Continued)

#	Finding	Resolution
14	<p>NIOSH did not apply a dose conversion factor (DCF) or dosimeter correction factors (CFs) to coworker dose.</p>	<p>NIOSH agrees that DCF of 1.244 was not applied to unmonitored photon dose. DCF was applied to monitored and missed doses. The dosimeter CF was 1.0 during this period and would not impact dose. NIOSH submitted a file showing the impact of the finding on case outcome did not change compensation.</p>
15	<p>Dosimeter uncertainty not applied to CTW coworker dose at Y-12.</p>	<p>NIOSH stated that measured badge reading should not be multiplied by a factor of 1.3, but the value should be entered into IREP as a mean of a normal distribution with a 30% uncertainty. The TBD was re-evaluated by SC&A and it was recommended the findings be closed. PRSC agreed.</p>
17	<p>No CTW correction [CTW adjustment factor] was applied to the unmonitored CTW internal dose at Hanford.</p>	<p>Employment was 1944 and intakes were based on air monitoring (Battelle-TBD-6000), which were considered higher than the OTIB-0052 guidance based on urinalysis. SC&A reassessed case and technical documents and recommended closing finding. PRSC agreed.</p>

Subtask 4 Guidance Document/Workbook Review Findings

#	Finding	Resolution
18	There does not appear to be any Hanford-specific technical guidance documents requiring the implementation of OTIB-0052 for internal coworker dose for CTWs.	NIOSH stated that rather than embarking on a path of revising the Site Profile, the OTIB-0052 requirements are built into the dose reconstruction tool, which is used by the dose reconstructor. SC&A found NIOSH's response to be acceptable, and the PRSC closed the finding.
19 (Kansas City Plant); 20 (Pantex); 21 (Weldon Spring)	There do not appear to be any guidance documents or workbooks for implementing CTW dose adjustment cited in OTIB-0052.	NIOSH stated that rather than embarking on a path of revising the Site Profile, the OTIB-52 requirements are built into the dose reconstruction tool, which is used by the dose reconstructor. SC&A found NIOSH's response to be acceptable, and the PRSC closed the finding.

Questions?