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ADVISORY BOARD ON RADIATION AND WORKER HEALTH

**NATIONAL INSTITUTE FOR
OCCUPATIONAL SAFETY AND HEALTH**

**A REVIEW OF NIOSH'S PROGRAM EVALUATION REPORT
OCAS-PER-014, "CONSTRUCTION TRADES WORKERS"**

**Contract No. 200-2009-28555
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ABBREVIATIONS AND ACRONYMS

| | |
|----------------|---|
| Advisory Board | Advisory Board on Radiation and Worker Health |
| AMWs | All Monitored Workers |
| CTW | Construction Trade Worker |
| DOE | U.S. Department of Energy |
| DR | Dose reconstruction |
| dpm | disintegrations per minute |
| GSD | geometric standard deviation |
| INL | Idaho National Laboratory |
| mrem | millirem |
| NIOSH | National Institute for Occupational Safety and Health |
| NOCTS | NIOSH OCAS Claims Tracking System |
| OCAS | Office of Compensation Analysis and Support [now known as the Division of Compensation Analysis and Support (DCAS)] |
| ORAUT | Oak Ridge Associated Universities Team |
| OTIB | ORAUT Technical Information Bulletin |
| PEP | Program Evaluation Plan |
| PER | Program Evaluation Report |
| PFG | Photofluorography |
| POC or PC | Probability of Causation |
| SC&A | S. Cohen and Associates |
| SRS | Savannah River Site |
| TBD | Technical Basis Document |

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1.0 STATEMENT OF PURPOSE

To support dose reconstruction (DR), the National Institute for Occupational Safety and Health (NIOSH) and the Oak Ridge Associated Universities Team (ORAUT) have assembled a large body of guidance documents, workbooks, computer codes, and tools. In recognition of the fact that all of these supporting elements in DR may be subject to revisions, provisions exist for evaluating the effect of such programmatic revisions on the outcome of previously completed DRs. Such revisions may be prompted by document revisions due to new information, misinterpretation of guidance, changes in policy, and/or programmatic improvements.

The process for evaluating potential impacts of programmatic changes on previously completed DRs has been proceduralized in OCAS-PR-008, *Preparation of Program Evaluation Reports and Program Evaluation Plans* (OCAS 2006), Revision 2, dated December 6, 2006. This procedure describes the format and methodology to be employed in preparing a Program Evaluation Report (PER) and a Program Evaluation Plan (PEP).

A PER provides a critical evaluation of the effect(s) that a given issue/programmatic change may have on previously completed DRs. This includes a qualitative and quantitative assessment of potential impacts. Most important in this assessment is the potential impact on the Probability of Causation (POC) of previously completed DRs with POCs of <50%.

As needed, a PEP may be issued that serves as a formal notification of an impending PER. The PEP provides a preliminary description of the issue(s) that will be addressed in the PER, and summarizes the likely scope of the effort required to complete the PER.

During an Advisory Board meeting on October 22, 2009, SC&A was tasked by the Advisory Board to conduct a review of OCAS-PER-014, *Construction Trades Workers* (OCAS 2007). In conducting a PER review, SC&A is committed to perform the following five subtasks, each of which is discussed in this report:

Subtask 1: Assess NIOSH's evaluation/characterization of the "issue" and its potential impacts on dose reconstruction. Our assessment intends to ensure that the "issue" was fully understood and characterized in the PER.

Subtask 2: Assess NIOSH's specific methods for corrective action. In instances where the PER involves a technical issue that is supported by document(s) (e.g., white papers, technical information bulletins, procedures) that have not yet been subjected to a formal SC&A review, Subtask 2 will include a review of the scientific basis and/or sources of information to ensure the credibility of the corrective action and its consistency with current/consensus science. Conversely, if such technical documentation has been formalized and previously subjected to a review by SC&A, Subtask 2 will simply provide a brief summary/conclusion of this review process.

Subtask 3: Evaluate the PER's stated **approach** for identifying the universe of potentially affected DRs, and assess the **criteria** by which a subset of potentially affected DRs was selected for re-evaluation. The second step may have important implications in instances

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where the universe of previously denied DRs is very large and, for reasons of practicality, NIOSH's re-evaluation is confined to a subset of DRs that, based on their scientific judgment, have the potential to be significantly affected by the PER. In behalf of Subtask 3, SC&A will also evaluate the timeliness for the completion of the PER.

Subtask 4: Conduct audits of DRs affected by the PER under review. Based on information contained in Table 2 (and discussed in Section 3.1 below), the number of DRs selected for audit for a given PER will vary. (It is assumed that the selection of the DRs and the total number of DR audits per PER will be made by the Advisory Board.)

Subtask 5: Prepare a comprehensive written report that contains the results of the above-stated subtasks, along with our review conclusions.

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2.0 SUBTASK 1: IDENTIFY THE CIRCUMSTANCES THAT NECESSITATED THE NEED FOR OCAS-PER-014

For new facility construction, most construction trade workers (CTWs) were **not** monitored since no radioactive materials were present before the facility was completed and had become operational. Thereafter, facility modification(s) and/or maintenance of major systems that now contained radioactive materials/contamination may have exposed CTWs, some of whom, however, were not monitored for external and/or internal exposure. Construction trade workers include (but are not limited to) laborers, mechanics, masons, carpenters, electricians, painters, pipe-fitters, boilermakers, millwrights, sheet-metal workers, iron-workers, insulators, etc.

To address the fact that some CTWs at various Department of Energy (DOE) sites were unmonitored, NIOSH issued ORAUT-OTIB-0052 (ORAUT 2006), Revision 00 (Technical Information Bulletin: *Parameters to Consider When Processing Claims for Construction Trade Workers*) on August 31, 2006, in order to provide guidance for the reconstruction of exposure by means of “adjusted” site-specific coworker data to those CTWs who were either unmonitored or inadequately monitored.

2.1 DEVELOPMENT OF ORAUT-OTIB-0052, REVISION 00

Because it was recognized that radiation exposures of CTWs may be different from other radiation workers and that the conventional use of assigning coworker dose(s) to **unmonitored** CTWs may not be claimant favorable, NIOSH sought empirical data that would assess the ratio of external and internal doses received by **monitored** CTWs to all monitored workers (AMWs).

External Dose Ratios. NIOSH identified seven major DOE sites [Savannah River Site (SRS), Rocky Flats, Y-12, K-25, X-10, Idaho National Laboratory (INL), and Hanford], where major construction activities took place and where exposures for monitored CTWs could be extracted from databases representing AMWs. Using the 95th percentile doses for CTWs and AMWs, dose and/or dose ratios (i.e., CTWs/AMWs) were derived by year for deep dose and shallow dose exposure for five of the seven sites, while for INL and Hanford, dose ratios were defined for **average** dose values.

Internal Dose Ratios. As a rule, the inclusion of workers in a **routine** bioassay program is based on the likely potential for intake of radioactive material. Consequently, routine internal monitoring of workers is more selective and, therefore, involves fewer workers than those monitored for external exposures. Moreover, bioassays frequently focus on select radionuclides that may dominate concerns of internal exposure.

To assess potential differences in internal exposures between CTWs and AMWs, NIOSH assessed urine bioassay data for **uranium** and **plutonium**. Annual ratios of excretion rates (defined in units of dpm/day at the 50th and 84th percentile) were derived for five of the seven sites (no data were available for INL and only limited data were available for SRS).

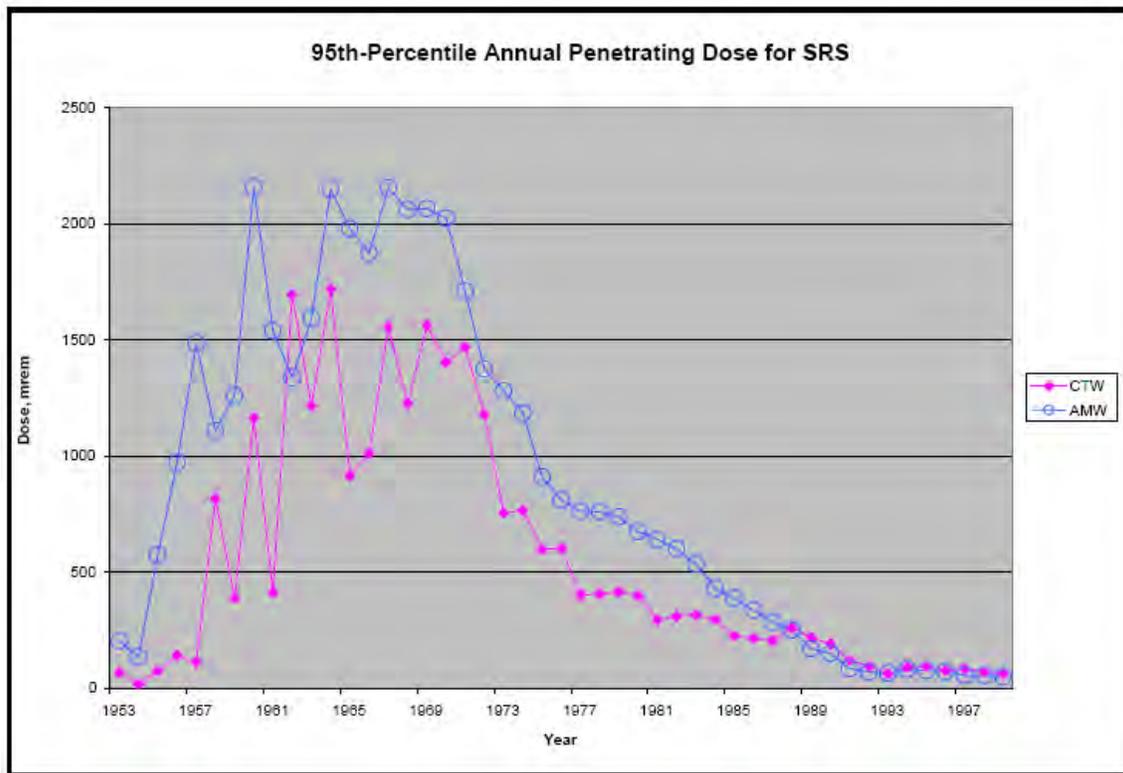
Site-specific external and internal data that contrasted CTW and AMW exposures were presented in a series of figures. For those years during which the observed external deep dose ratios

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(CTWs/AMWs) equaled or exceeded the value of 1.3, NIOSH provided a companion table that quantified the 95th percentile values for each group along with the total number of persons monitored with and without measurable dose.

For illustration, Figure 5-2 of OTIB-0052, shown below as Exhibit #1, represents annual external deep dose exposure data for SRS between 1953 and 1999; and Table 5-1 of OTIB-0052 (Table 1 below) identifies those years when the 95th percentile deep dose among CTWs exceeded those of AMWs by a factor greater than 1.2.

Exhibit #1: 95th Percentile Penetrating Dose for Savannah River Site



Source: ORAUT-OTIB-0052, Figure 5-1

Table 1. Observed Ratios for SRS

| Year | CTWs | | | AMWs | | | Observed ratios (CTWs/AMWs) |
|------|------------------|-----------------------------|---|------------------|-----------------------------|---|-----------------------------|
| | Number monitored | Number with measurable dose | 95 th percentile dose (mrem) | Number monitored | Number with measurable dose | 95 th percentile dose (mrem) | |
| 1962 | 259 | 236 | 1696 | 3371 | 3101 | 1337 | 1.3 |
| 1989 | 2408 | 1818 | 218 | 15517 | 8749 | 170 | 1.3 |
| 1990 | 2440 | 1567 | 190 | 18494 | 8503 | 150 | 1.3 |
| 1991 | 2202 | 1104 | 120 | 18630 | 6468 | 85 | 1.4 |
| 1992 | 1902 | 792 | 95 | 17780 | 5016 | 70 | 1.4 |
| 1997 | 949 | 317 | 83 | 11344 | 2410 | 55 | 1.5 |
| 1998 | 870 | 280 | 71 | 10750 | 2210 | 54 | 1.3 |
| 1999 | 785 | 240 | 62 | 10365 | 2159 | 49 | 1.3 |

Source: ORAUT-OTIB-0052, Table 5-1

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2.2 RELEVANT CONCLUSIONS PRESENTED IN ORAUT-OTIB-0052

On August 31, 2006, NIOSH issued ORAUT-OTIB-0052, Revision 00, for the purpose of providing the basis and guidance for performing DRs for unmonitored CTWs.

On the basis of study data obtained in behalf of OTIB-0052, NIOSH stated the following conclusions and guidance, as given in Section 7.0 of OTIB-0052:

For External Deep Dose:

. . . the dose received by monitored CTWs was usually bounded by the dose received by AMWs on the same site.

*This relationship between the doses received by CTWs and AMWs can be combined with the premise that the nature of the construction work (e.g., carpentry, masonry, pipe-fitting, etc.) performed by unmonitored CTWs was **not** significantly different (from a radiation protection perspective) than the construction work activity performed by monitored CTWs. Doses to monitored CTWs can therefore serve as an acceptable surrogate for doses to unmonitored CTWs. [Emphasis added.]*

*An analysis of the specific DOE sites identified **specific years** that CTWs' [deep] doses exceeded AMWs doses. To address these instances, an adjustment factor is needed. [Emphasis added.]*

The values for pre-1961 adjustment factors range from 1.3 to 1.4.

*The maximum value of 1.4 was selected as the prescribed **favorable** to claimant external dose adjustment factor (i.e., dose multiplier) for all DOE facilities for all years. [Emphasis added.]*

*The application of the conclusions and adjustment factors derived in this document are limited to dose reconstructions for unmonitored construction workers at sites with **applicable coworker** data . . . [Emphasis added.]*

For Non-penetrating Dose

Based on the comparison of data that showed that CTWs doses were adequately bounded by AMWs' doses, Section 8.3 of OTIB-0052 recommends the use of the 95th percentile non-penetrating dose of the site-specific coworker study:

. . . for those CTWs whose dose history is either unavailable or incomplete unless there is compelling evidence to use another coworker percentile value.

*. . . Dose reconstructors should **not** apply any **adjustment factors** for non-penetrating dose. [Emphasis added.]*

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For Internal Dose

Section 8.4 of OTIB-0052 provides the following guidance for assigning internal dose to unmonitored CTWs:

For Hanford dose reconstructions covered by this OTIB, the intake rates in the Hanford coworker document should be multiplied by a factor of two.

For all other sites, the internal dose should be determined using the same method that is applied to all other workers. If coworker data studies are available for a site, the 50th percentile should be used with the appropriate GSD unless there is compelling evidence to use another coworker percentile value.

For Occupational Medical Dose

Section 8.5 of OTIB-0052 provides the following guidance:

If there are X-ray records in the file, the dose reconstructor should use the Technical Basis Document (TBD) for the site where the worker performed the work

For sites where “X-ray records do not exist” is indicated and there are in fact no X-ray records in the file or for sites that are not currently including X-ray records, such as Y-12 and INL, the dose reconstructor should use the TBD for the site where the worker performed the work to assign the frequency or X-ray procedures that are clearly not a result of work-related injury. However, since these procedures may have been performed off-site, the assigned organ doses should come from Dose Reconstruction from Occupationally Related Diagnostic X-Ray Procedures (ORAUT 2005j). All X-ray procedures in this category should be assumed to be standard X-rays (not PFG) since PFG was an X-ray technique suitable to screening large groups of people at one time. Assuming the X-rays were performed off-site at a local clinic or hospital, it is unlikely that this screening occurred en masse with PFG.

2.3 SC&A’S COMMENTS, OBSERVATIONS, AND FINDINGS PERTAINING TO ORAUT-OTIB-0052 AS THE PRINCIPAL SUPPORT DOCUMENT FOR OCAS-PER-014

2.3.1 External Penetrating Dose Adjustment Factor

Guidance for the reconstruction of external penetrating dose for unmonitored CTWs involves the use of a 1.4 adjustment factor (i.e., multiplier) and the 95th percentile, site-specific coworker dose. Based on dose data that compared CTW to AMW doses for six DOE sites, NIOSH’s selection of the 1.4 adjustment factor for **all** DOE facilities and for **all** years appears to be conservative and claimant favorable.

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At this time, SC&A has neither been given access to the original dose data nor an explanation that would indicate whether the **annual** doses for CTWs and AMWs were scaled to reflect **exposure/employment duration** in any given year. Unlike “all monitored workers” who mostly represent full-time employees/workers at a site, CTWs are more likely to be hired on an as-needed basis and for restrictive time periods that may represent a small fraction(s) of a given year.

Finding #1 (Conditional): The Deep-Dose Adjustment Factor of 1.4 May Not be Claimant Favorable. In the event that annual doses for CTWs (and to a lesser extent for AMWs) were not adjusted to account for exposure/employment periods of less than a full year, the recommended deep-dose adjustment factor of 1.4 may not be claimant favorable.

Finding #2 (Conditional): The Inclusion of CTWs Among AMWs May Obscure Dose Differences. As stated in Section 4.0 of OTIB-0052, “. . . Sometimes the AMW group **includes** the CTWs and in others it did not.” However, the OTIB does not identify which data sets (i.e., external deep dose, shallow dose, and/or bioassay data sets) failed to separate CTW from AMW data.

A review of external data contained in Tables 5-1, 5-2, 5-3, 5-4, and 6-1 of OTIB-0052 identifies the following:

- (1) The number of monitored CTWs relative to AMWs represents a substantial fraction of AMWs.
- (2) A ratio of “number monitored” to “number with measurable dose” among CTWs is consistently lower than those for AMWs.

The inclusion of CTWs among AMWs, therefore, obscures the true ratios of CWTs/AMWs in instances where AMWs represent a combination of CTWs and **non**-CTWs.

2.3.2 External Shallow Dose

Only two of the eight DOE sites (i.e., SRS and Rocky Flats) provided annualized shallow dose data for deriving CTWs/AMWs dose ratios. According to NIOSH, these limited data, nevertheless, suggest that AMW doses consistently bounded CTW doses and obviate the need for an adjustment factor.

Finding #3 (Conditional): A Shallow-Dose Adjustment Factor May be Required. Annual shallow doses (like penetrating doses) received by CTWs may, nevertheless, have been understated in the event that NIOSH failed to adjust CTW shallow doses to account for employment/exposure periods of less than 1 year as was cited in Findings 1 and 2 above for penetrating dose assessment.

If Finding #1 holds and there are significant differences in exposure times between CTWs and AMWs in any given year, an adjustment factor may be required for the reconstruction of shallow dose for CTWs.

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2.3.3 Internal Dose

Section 8.4 of OTIB-0052 provides guidance for internal DR in behalf of the following three conditions:

- (1) For **Hanford** DRs, coworker intake rates should be multiplied by a factor of two.
- (2) For **all other sites**, the internal dose should be determined using the **same method** that is applied to all other workers.
- (3) **If** coworker data studies are available for a site, the 50th percentile should be used with the appropriate geometric standard deviation (GSD).

Finding #4: Guidance for Internal Dose. Guidance for the reconstruction of dose in behalf of Condition 2, as stated above, is incomplete/confusing. The Executive Summary of OTIB-0052 states that “. . . This document provides guidance for performing DRs for unmonitored construction trade workers (CTWs).” In the absence of (1) internal monitoring data for the CTW and (2) coworker data, it is unclear what is meant by the recommendation “. . . the internal dose should be determined using the same method that is applied to all other workers.”

3.0 SUBTASK 2: ASSESS NIOSH'S SPECIFIC METHODS FOR CORRECTIVE ACTION

3.1 CRITICAL ELEMENTS THAT DEFINE OCAS-PER-014

OCAS-PER-014, Revision 0, was issued on November 28, 2007, and provides the following information and criteria in order to address DR of CTWs:

From Section 1.0: Description

. . . To address this issue, ORAUT-OTIB-0052 . . . was issued on 8/31/2006 to provide guidance on assessing exposure to CTWs with inadequate monitoring (either internal or external). [Emphasis added.]

From Section 2.0: Issue Evaluation

. . . This document [ORAUT-OTIB-0052] multiplies by 1.4 the external dose determined from a co-worker study. At Hanford, the internal dose is also adjusted by using a 2.0 multiplier on the monitored worker's internal intakes.

. . . The sites that had external co-worker studies issued prior to 8/31/2006, and must be evaluated under this PER, are listed in the table below. [Emphasis added.]

Table 2. DOE Sites with an External Coworker Model Issued Prior to August 31, 2006 that Must Be Evaluated Under PER-014

| Site | First published coworker | |
|---------------------------------------|--------------------------|-------------------|
| | Date | Document |
| Hanford | 3/23/2005 | ORAUT-OTIB-0030 |
| Pacific Northwest National Laboratory | 3/23/2005 | ORAUT-OTIB-0030 |
| Kansas City Plant | 5/31/2005 | ORAUT-TKBS-0031 |
| Los Alamos National Laboratory | 5/10/2005 | ORAUT-TKBS-0010-6 |
| Pantex Plant | 7/27/2006 | ORAUT-TKBS-0013-6 |
| Portsmouth Gaseous Diffusion Plant | 7/29/2005 | ORAUT-OTIB-0040 |
| Savannah River Site | 5/31/2005 | ORAUT-OTIB-0032 |
| Weldon Spring Plant | 6/24/2005 | ORAUT-TKBS-0028-6 |
| Oak Ridge National Laboratory (X-10) | 12/29/2004 | ORAUT-OTIB-0021 |
| Y-12 Plant | 9/9/2004 | ORAUT-OTIB-0013 |

Source: OCAS-PER-014

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From Section 3.0: Plan for Resolution or Corrective Action

A search of the claims from the sites in the table above was conducted to determine which claims may be those of Construction Trades Workers. The NOCTS Job Title, as well as the original dose reconstruction report, was searched for any of the key words listed in appendix A. . . . Only those claims with a probability of causation (PC) less than 50%, that are currently at the Department of Labor and whose dose reconstruction was approved prior to 8/31/2007 were included.

*These search criteria resulted in **977 potentially** affected claims being selected. [Emphasis added.]*

3.2 SC&A'S COMMENTS REGARDING CORRECTIVE ACTIONS TAKEN BY NIOSH FOR IDENTIFYING POTENTIALLY ELIGIBLE CTW CLAIMS

Critical to the successful implementation of OCAS-PER-014 is the accurate/complete identification of all workers that may have been exposed as a member of a construction trade. Search criteria for the NOCTS database and DR Reports, as cited in Attachment A of OCAS-PER-014, included 31 different construction trades.

Given the types of facilities that define DOE sites, the spectrum of construction trades identified in Attachment A appear to be sufficiently inclusive/complete for the purpose of screening CTW claimants that may be affected by OCAS-PER-014. SC&A, therefore, agrees with the methodology used by NIOSH to identify the **977 potentially** affected claims.

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4.0 SUBTASK 3: EVALUATE THE PER'S STATED APPROACH FOR IDENTIFYING THE NUMBER OF DOSE RECONSTRUCTIONS REQUIRING RE-EVALUATION OF DOSE

The 977 potentially affected claims with POC values less than 50% will be evaluated by NIOSH in order to identify those claims for which the impact of OTIB-0052 will raise their POC value to a revised level that mandates a new DR. NIOSH intends to use the following criteria:

- (1) Verify that the claim is a CTW since the "key word search method" (that identified the 977 claims) could not verify the proper context of the key words and it is possible that some of the 977 claims should not have been included as a CTW claim.
- (2) "Review the external dose of the claim. **If no external coworker dose was assigned (and internal for Hanford), there is no OITB-0052 adjustment to be made** and no need for further evaluation." [Emphasis added.]
- (3) Due to NIOSH's existing policy that a $POC \geq 45\%$ requires 30 IREP runs with 10,000 iterations per run, the 977 potential claims will be screened based on the ability of OTIB-0052 to raise the original POC value to a revised POC value of $\geq 45\%$.
- (4) Given that OTIB-0052 would increase the external dose by a factor of 1.4 (and for Hanford, also increase the internal dose by 2.0 fold), it is clear that only a subset of the 977 potentially affected claims will require a new DR using the equation $PC = [ERR/(1 + ERR)]100$. NIOSH determined that OTIB-0052 **cannot** raise the POC to 45% if the original POC was $\leq 36.8\%$ for nine facilities in Table 2 above and $\leq 29.0\%$ for Hanford.
- (5) Identify the original POC value of the claim and determine if it meets the above-cited trigger value of 36.8% (or 29% for Hanford CTW claims).
 - For a POC value greater than or equal to the trigger value, a new DR is necessary.
 - For a POC value less than the trigger value, determine if there are any other PERs that may affect the claim and assess the need for a new DR.

Finding #5: 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 OCAS-PER-014. 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, therefore, a new DR. In Section 3.0 of OCAS-PER-014, NIOSH only provided the following information:

NIOSH will provide DOL with the list of 977 claims, as well as a determination on each claim as to whether a new dose estimate is required. Documentation, that includes a dispositive statement which explains the basis as to why each claim was or was not determined to require a new dose reconstruction, will be provided to DOL and included in each case file.

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4.1 SC&A'S COMMENTS REGARDING NIOSH'S APPROACH

SC&A believes that the **key word search method** (which identified a total of 977 claims) provides a valid starting point for defining the universe of CTW claims that potentially may be impacted by OTIB-0052.

SC&A further agrees with the derived POC values of 38.6% and 29% as **trigger values** for selecting only those claims among the universe of 977 claims that have the **potential** of exceeding a POC value of 45% and must, therefore, be re-evaluated by means of a new DR.

SC&A, however, has concerns regarding NIOSH's screening criteria #1 of CTW claims, as stated on page 4 of PER-014 (and quoted herein on page 14 above):

*External Co-Worker dose assigned. If **no external** co-worker dose was assigned (also internal at Hanford), there is **no** OTIB-0052 adjustment to be made and the claim is **not** affected by OTIB-0052. [Emphasis added.]*

While the above stated criterion is consistent with the stated but limited objective defined in OTIB-0052 and PER-014, the **requirement** for a CTW claim to have an "assigned external coworker dose (also internal at Hanford)," may represent a potentially generic deficiency for CTWs that goes beyond the scope of OCAS-PER-014, as explained below.

A review of Table 2 above identifies the dates-of-issue of the first published coworker data sets for each of the 10 DOE sites covered under PER-014. Issue dates of the coworker study data range from September 9, 2004 (for Y-12), to as recently as July 27, 2006 (for Pantex). SC&A's concern involves those CTW claims with the following attributes:

- Claims representing CTWs who were **unmonitored** or inadequately monitored and whose DR was adjudicated **before** the issue date of the site-specific external coworker (as well as the internal coworker) model.
- For CTW claims completed/adjudicated before the issuance of a coworker model(s), DR for the unmonitored CTW would have been limited to environmental dose and possible medical dose with resultant POC values that would likely be well **below** the trigger PC values of 38.6% (and 29% for Hanford) and, therefore, be excluded from further consideration.
- Even for those CTW claims that exceed the POC trigger value, the **absence** of an assigned coworker dose excludes the eligibility of these claims for a new DR.

At the writing of this review, SC&A is neither aware of any **past** effort by NIOSH that would have identified and assigned coworker doses to those CTW claims that had been adjudicated **before** their respective site-specific coworker model had been issued in order to make them eligible for evaluation under OCAS-PER-014; nor is SC&A aware of a future effort to do so.

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If SC&A is correct in both assumptions, a potentially substantial number of the 977 will (1) have an incomplete DR and (2) be excluded from a revised DR, as provided by selection criteria cited in OCAS-PER-014.

Finding #6 (Conditional): OCAS-PER-014, Revision 00, May Be Highly Restrictive in Addressing the Problem of Unmonitored Construction Trade Workers. At this time, there is uncertainty about the fate of CTW claims that had been adjudicated before the issuance of a coworker model. This **conditional** finding is based on the following statement in Section 2.0 of OCAS-PER-014:

*A number of DOE sites did not yet have an external co-worker study published when OTIB-0052 was issued. Since dose reconstructions for claims at these sites completed prior to the issuance of OTIB-0052 could not have used external co-worker values, there is **no change** to these claims as a result of the issuance of OTIB-0052. . . . [Emphasis added.]*

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5.0 SUBTASK 4: CONDUCT AUDITS OF A SAMPLE SET OF DRS AFFECTED BY OCAS-PER-014

At the writing of this review, SC&A has not been provided any information as to whether NIOSH has even proceeded to evaluate the 977 claims in order to determine which of these claims are affected by OCAS-PER-014 and require a new dose estimate.

Thus, the selection of a sample set of DRs for audit cannot proceed until NIOSH provides the Advisory Board's DR Subcommittee with a list of DRs that were affected by OCAS-PER-014 and for which new doses were derived. Once the aforementioned list of claims with reconstructed doses has been made available to the Subcommittee, SC&A recommends selection of 10 DRs (one DR from each of the 10 DOE sites listed in Table 2) for SC&A's audit.

6.0 SUMMARY CONCLUSIONS

In our review of OCAS-PER-014, SC&A identified a total of six findings, three of which are cited as “conditional.” These findings reflect a lack of or restrictive access to information; NIOSH’s failure to proceed with the evaluation of the 977 CTW claims; and most importantly, issues/findings related to ORAUT-OTIB-0052, Rev. 00, which to date remain unresolved.

Since OTIB-0052 provides guidance for performing DRs for unmonitored CTWs and thereby serves as the technical basis for the implementation of OCAS-PER-014, the following historical facts should be noted:

- (1) Revision 00 of OTIB-0052 was first reviewed by SC&A in July 2007. A total of 16 findings were identified and discussed in a series of Work Group meetings without full resolution.
- (2) On February 17, 2011, NIOSH issued Revision 01 of OTIB-0052 with changes that were to address the 16 findings.
- (3) Revision 01 of OTIB-0052 was again critically reviewed by SC&A in a report submitted in July 2011. In this report, SC&A identified (1) the status of the 16 findings against OTIB-0052 prior to Revision 01; (2) the recommended status of each finding following Revision 01 of OTIB-0052; and (3) the status of other OTIBs that support OTIB-0052. Table 3 provides a historical summary of findings associated with OTIB-0052.

Table 3. Status of Historical Findings Associated with OTIB-0052

| Finding | Status Prior to Revision 1 | Recommended Status After Revision 1 |
|----------------------|-----------------------------------|--|
| <i>OTIB-0052-01:</i> | Transferred to Issue OTIB-0052-16 | Transferred to ORAUT-OTIB-0020 |
| <i>OTIB-0052-02:</i> | Closed | Closed |
| <i>OTIB-0052-03:</i> | Closed | Closed |
| <i>OTIB-0052-04:</i> | Closed | Closed |
| <i>OTIB-0052-05:</i> | In Progress | Closed |
| <i>OTIB-0052-06:</i> | Closed | Closed |
| <i>OTIB-0052-07:</i> | Closed | Closed |
| <i>OTIB-0052-08:</i> | Closed | Closed |
| <i>OTIB-0052-09:</i> | In Progress | Closed |
| <i>OTIB-0052-10:</i> | In Progress | Closed |
| <i>OTIB-0052-11:</i> | In Progress | Closed |
| <i>OTIB-0052-12:</i> | In Abeyance | In Progress |
| <i>OTIB-0052-13:</i> | In Progress | In Progress |
| <i>OTIB-0052-14:</i> | In Progress | In Progress |
| <i>OTIB-0052-15:</i> | Transferred to ORAUT-OTIB-0020 | Transferred to ORAUT-OTIB-0020 |
| <i>OTIB-0052-16:</i> | Transferred to ORAUT-OTIB-0020 | Transferred to ORAUT-OTIB-0020 |
| <i>OTIB-0020:</i> | Not Applicable | Not Applicable |
| <i>OTIB-0014-01:</i> | Transferred to ORAUT-OTIB-0052 | Transferred to ORAUT-OTIB-0052 |

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7.0 REFERENCES

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OCAS 2007. *Construction Trades Workers*, OCAS-PER-014, Revision 0, NIOSH's Office of Compensation Analysis and Support, Cincinnati, Ohio. November 28, 2007.

ORAUT 2004a. *Technical Information Bulletin: Individual Dose Adjustment Procedure for Y-12 Dose Reconstruction*, ORAUT-OTIB-0013, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. September 9, 2004.

ORAUT 2004b. *Technical Information Bulletin – External Coworker Dosimetry Data for the X-10 Site*, ORAUT-OTIB-0021, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. December 29, 2004.

ORAUT 2005a. *External Coworker Dosimetry Data for Hanford Site*, ORAUT-OTIB-0030, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. March 23, 2005.

ORAUT 2005b. *Los Alamos National Laboratory – Occupational External Dose*, ORAUT-TKBS-0010-6, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. May 10, 2005.

ORAUT 2005c. *External Coworker Dosimetry Data for Savannah River Site*, ORAUT-OTIB-0032, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. May 31, 2005.

ORAUT 2005d. *Site Profile for the Kansas City Plant*, ORAUT-TKBS-0031, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. May 31, 2005.

ORAUT 2005e. *Weldon Spring Plant – Occupational External Dose*, ORAUT-TKBS-0028-6, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. June 24, 2005.

ORAUT 2005f. *External Coworker Dosimetry Data for the Portsmouth Gaseous Diffusion Plant*, ORAUT-OTIB-0040, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. July 29, 2005.

ORAUT 2005g. *Use of Coworker Dosimetry Data For External Dose Assignment*, ORAUT-OTIB-0020, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. October 7, 2005.

ORAUT 2005h. *Internal Coworker Dosimetry Data for Hanford Site*, ORAUT-OTIB-0036, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. October 28, 2005.

NOTICE: This report has been reviewed for Privacy Act information and has been cleared for distribution. However, this report is pre-decisional and has not been reviewed by the Advisory Board on Radiation and Worker Health for factual accuracy or applicability within the requirements of 42 CFR 82.

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ORAUT 2005j. *Dose Reconstruction from Occupationally Related Diagnostic X-Ray Procedures*, ORAUT-OTIB-0006, Rev. 03 PC-1, Oak Ridge Associated Universities Team: Cincinnati, Ohio. December 21, 2005.

ORAUT 2006a. *Pantex Plant National Security Complex – Occupational External Dose*, ORAUT-TKBS-0013-6, Rev. 00, Oak Ridge Associated Universities Team: Cincinnati, Ohio. July 27, 2006.

ORAUT 2006b. *Parameters to Consider When Processing Claims for Construction Trade Workers*, ORAUT-OTIB-0052, Revision 00, Oak Ridge Associated University Team: Cincinnati, Ohio. August 31, 2006.