Summary of Six Document Reviews Approved by the Subcommittee for Procedure Reviews

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Advisory Board on Radiation and Worker Health

December 5, 2024

SPR-approved documents

- OCAS-PER-009, rev. 0, “Target Organs for Lymphoma”
- ORAUT-OTIB-0057, rev. 00, “External Radiation Dose Estimates for Individuals Near the 1958 Criticality Accident at the Oak Ridge Y-12 Plant”
- ORAUT-PROC-0090, rev. 00, “Computer Assisted Telephone Interview Process”
- ORAUT-PROC-0092, rev. 00, “Close-Out Interview Process”
- DCAS-PER-062, rev. 0, “ORAUT-OTIB-0052”
- OCAS-PER-017, rev. 0, “Evaluation of Incomplete Internal Dosimetry Records from Idaho, Argonne–East and Argonne–West National Laboratories”

OCAS-PER-009, rev. 0

- Title: “Target Organs for Lymphoma”
- Issued March 8, 2007
- Assesses the effect of changing internal and external dosimetry target organs used for several forms of lymphoma
  - Changes resulted from the issuance of OCAS-TIB-012, “Selection for Internal and External Dosimetry Target Organs for Lymphatic/Hematopoietic Cancers”
- Doses increased due to:
  - Internal target organs for most forms of non-Hodgkin’s lymphoma and some forms of lymphoma changed from highest non-metabolic organ or remainder to thoracic lymph nodes
  - External target organ was changed from bone marrow to various other organs (stomach, spleen, thyroid, lung, bladder, etc.) for most forms of lymphoma

SC&A's subtasks 1–3 review of PER-009, rev. 0

- Review issued June 20, 2008
- SC&A's subtasks 1–3 review identified two findings
- SC&A initially presented review to the SPR at its April 2, 2008, meeting
- Further discussion held at SPR meetings:
  - July 26, 2010 (transcript pages 193 to 239)
  - January 5, 2011 (transcript pages 28 to 73)

OCAS-PER-009 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
6/20/2008	For certain lymphomas, there is a substantial level of uncertainty about the cell-line of origin for the neoplasm, and anatomical location where the neoplastic transformation took place. Diagnostic method refinements have reduced the classification uncertainty of lymphomas. However, the concern is for claims diagnosed during times when clinical data were inadequate for the assignment of an ICD-9 code.	**1/5/2011.** NIOSH does not question DOL's ICD-9 selection, but simply performs the DR using the provided cancer classification.	**1/5/2011.** SPR closed the finding but will advise DOL that this issue was discussed at length. The concern involves changes in diagnoses process that occurred over the last decade; SPR will ask DOL if this is an issue they can investigate.

OCAS-PER-009 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
6/20/2008	It has been shown that the number of macrophages in the deep lung of a smoker are much higher than nonsmoker. This results in an enhanced removal mechanism of particulate matter that is transferred to regional lymph nodes, meaning a smoker is at higher risk.	**1/5/2011.** No response required.	**1/5/2011.** SPR stated that although this issue may have a significant impact, it is beyond the purview of the Board or NIOSH to even address the issue. Therefore, the SPR closed the finding.

SC&A's subtask 4 review of PER-009, rev. 0

- Three cases from the 500 cases evaluated were selected for review of reworked external and internal doses
- Subtask 4 report issued February 4, 2014
- SC&A's subtask 4 review identified 4 findings
- SC&A initially presented review to the SPR at its November 25, 2014, meeting

OCAS-PER-009 subtask 4 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
2/4/2014	SC&A questions the technical basis/protocol for the assignment of and subsequent changes to ICD-9 codes, which included consolidating two primary lymphomas to one lymphoma.	**11/25/2014.** NIOSH does not typically question DOL's diagnosis; they reconstruct according to the diagnosis identified by DOL.	**11/25/2014.** Since this matter is outside the Subcommittee purview, the finding will be closed and called to the attention of the DOL.

OCAS-PER-009 subtask 4 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
2/4/2014	For occupational medical doses assigned to each lymphoma, the DR report states that organ doses were based on Attachment E of ORAUT-PROC-0006, rev. 00. However, there is no Attachment E of PROC-0006.	**11/25/2014.** NIOSH recognizes the omission of the title "Attachment E" in ORAUT-PROC-0006, rev. 0. However, the Table of Contents refers the reader to page 94 of the procedure.	**11/25/2014.** Based on NIOSH's response, the SPR closed the finding.

OCAS-PER-009 subtask 4 finding 3

Finding date	Finding description	NIOSH response	Finding resolution
2/4/2014	Inappropriate maximizing assumptions were used to derive missed photon dose. Maximizing assumptions are appropriate under select conditions of uncertainty or as an efficiency measure; neither of these conditions apply in this case.	**11/25/2014.** In 2007, when the DR in question was performed, the maximizing approach for assessing missed external dose was a standard efficiency method. This maximizing approach is typically no longer used.	**11/25/2014.** Based on NIOSH's response, the SPR closed the finding.

OCAS-PER-009 subtask 4 finding 4

Finding date	Finding description	NIOSH response	Finding resolution
2/4/2014	Values cited for external photon and neutron doses are incorrect due to an error in the Fernald Calculation Workbook version 1.19.	**11/25/2014.** The 1.19 version of the tool is working properly. The 1.43 and 1.3 correction factors (depending on photon energy range) are being applied to the measured dose, but not to the missed dose. For the reviewed claim, there was no measured dose.	**11/25/2014.** Based on NIOSH's response, the SPR closed the finding.

Discussion of OCAS-PER-009

ORAUT-OTIB-0057, rev. 00

- Title: “External Radiation Dose Estimates for Individuals near the 1958 Criticality Accident at the Oak Ridge Y-12 Plant”
- Rev. 00 issued May 15, 2006
- Reviews available dosimetry data and its potential application in dose reconstruction for Y-12 workers near the nuclear criticality accident in Building 9212 in 1958
- SC&A reviewed the OTIB in October 2007, pages 224–229
  - 3 findings identified
- SC&A’s review discussed at October 15, 2009, SPR meeting

ORAUT-OTIB-0057 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
10/29/2007	To correct and clarify, SC&A suggested: (1) page 7 lists the whole-body limit as 15 mrem/yr; rather than 15 rem/yr; (2) page 13, last column of Table 5-1 should indicate that the first collision dose equivalent was derived "using an RBE of 2.0"; (3) page 16, "neutron energies greater than 10 keV was 13.5%" should be changed to "less than."	**10/15/2009.** NIOSH agreed.	**10/15/2009.** SPR closed the finding.

ORAUT-OTIB-0057 finding 2

- **Finding 2:** OTIB lacks sufficient detailed analysis about the dose uncertainty. The OTIB suggested uncertainty of ~25%. In accident situation, an uncertainty in the range of at least +50% is needed to encompass the feasible doses and to ensure claimant favorability.
- **10/15/2009 NIOSH Response:** NIOSH disagrees with finding for the following reasons:
  - Using known locations and estimates of number of fissions during accident, early estimates of radiation doses received by eight most highly exposed workers were unreasonably high. Therefore, first collision doses can be used to make estimates dose to organs of the body with uncertainties of less than approximately plus or minus 25%.
  - Some uncertainties were accounted for using a realistic physical mock-up of the accident, which cannot be classified as a major unknown or uncertainty.
  - Interviews were conducted of employees in the building at the time of the accident.
  - The dose measurement errors for sodium activation of whole blood and difference between burro and man have already been taken into account.
- **Finding resolution**: Based on NIOSH's response, SPR closed finding at 3/22/2011 meeting.

ORAUT-OTIB-0057 finding 3

- **Finding 3:** No technical comparison/validation done of neutron dose results obtained by sodium analysis at various distances to those obtained by inverse-square of the distance for the two workers (F and G) at 25 ft, which were used to estimate the dose to other workers further away from the accident.
- **10/15/2009 NIOSH Response:** NIOSH disagrees for following reasons:
  - There is no correlation between the estimated doses for EEs (A – E) and their initial distances from the nuclear criticality. Doses that are significantly different than those based simply on distance from the criticality accident can be attributed to their movements following the sounding of the alarms.
  - EEs F and G were likely exposed for the longest period, so the doses to EEs F and G would be the baseline for estimating dose to other employees using an inverse square of the distance of each of the 23 other employees from the nuclear criticality.
  - Five of these 23 additional employees were wearing beta-gamma film badges, and estimates of gamma dose were in close agreement in one case and extremely claimant favorable in the other four cases.
- **Finding resolution:** Based on NIOSH's response, SPR closed finding at 3/22/2011 meeting.

Discussion of ORAUT-OTIB-0057

ORAUT-PROC-0090, rev. 00

- Title: “Computer Assisted Telephone Interview Process”
- Rev. 00 issued June 21, 2005; rev. 01 issued March 3, 2011
- Establishes program requirement for the performance of a computer-assisted telephone interview
- PROC-0090 replaces:
  - PROC-0004, “Scheduling Telephone Interviews”
  - PROC-0005, “Performing Telephone Interviews”
  - PROC-0017, “Reviewing Telephone Interviews”
- SC&A reviewed the original PROCs in January 2005, pages 189–236
  - 29 findings identified
- NIOSH addressed the findings using PROC-0090 guidance
- SC&A’s review initially discussed at December 11, 2007, SPR meeting
- Follow-up discussion held at June 24, 2008; July 21, 2008; and April 28, 2015, SPR meetings

ORAUT-PROC-0090 findings 1–4

- **Finding 1:** Interview letter sent out without adequate dose reconstruction information
- **Finding 2:** Interview letter lacking in essential content, especially for family member claimants
- **Finding 3:** Same letter is sent to all claimants, which has an implicit bias for family member claimants who likely need more preparation prior to receiving interview letter
- **Finding 4:** Request for telephone interview is done without better claimant preparation

PROC-0090 findings 1–4 resolution

- NIOSH developed a draft “Acknowledgement Packet” and a revised attachment to the CATI letter to address these findings.
- SC&A reviewed new packet and revised letter and agreed that findings were adequately addressed.
- SPR closed the findings at the July 21, 2008, meeting.

ORAUT-PROC-0090 finding 6 (note: no finding 5)

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	There is no procedure for the closeout interview and issues related to it that are relevant at the CATI stage.	**7/21/2008.** NIOSH has since published a closeout interview procedure (PROC-0092). This finding should be transferred to resolution of PROC-0092 findings.	**10/15/2009.** NIOSH and SC&A agreed that this issue was covered by ORAUT-PROC-0092. SPR closed the finding and transferred it to PROC-0092.

ORAUT-PROC-0090 finding 7

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	No procedure or requirement for coworker interview or explanation if coworkers not interviewed.	**7/21/2008.** NIOSH explained that generally coworkers are not contacted, since there usually is enough information to perform a dose reconstruction without coworker input. NIOSH will 1) suggest wording changes in interactions with the claimants, and 2) add a definition of coworker and/or the term coworker could be changed to "fellow worker."	**7/21/2008.** SPR changed the status of the finding to in abeyance awaiting NIOSH's changes. **10/15/2009.** The revised CATI form was reviewed and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 8

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Procedure lacks sufficient information to assist the recipient in interpreting the questions, especially for family member claimants.	**7/21/2008.** Interviewers do not coach claimants or reject information. The interviewers are trained to assist the claimant through the interview process and, if needed, an HP will assist the interviewer. NIOSH will revise PROC-0090 and the CATI form.	**7/21/2008.** SPR changed the status of the finding to in abeyance awaiting NIOSH's changes. **4/28/2015.** SC&A reviewed the revised CATI form and found it to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 9

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Interviewer not required to have incident list, job category list, or familiarity with facility.	**7/21/2008.** It is unlikely, given the number of covered facilities, that all incidents, job categories, etc., could be appropriately covered during the telephone interview. For the same reason, interviewers cannot be extensively knowledgeable about operations at all facilities. NIOSH will revise the CATI form.	**7/21/2008.** SPR changed finding to in abeyance awaiting NIOSH's changes. **4/28/2015.** SC&A reviewed the revised CATI form and found it to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 10

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Interviewer not required to have knowledge of facility though some may.	**7/21/2008.** NIOSH attempts to use interviewers who are familiar with the site, but that it is not a requirement. NIOSH stated they would attempt to assign interviewers to certain sites and provide site-specific training to interviewers.	**7/21/2008.** Based on NIOSH's response, SPR closed the finding.

ORAUT-PROC-0090 finding 11

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Procedure is implicitly biased in cases of family member claimants and no coworker interview is required before denial.	**7/21/2008.** This finding is similar to finding 7. As with finding 7, NIOSH will 1) suggest wording changes in interactions with the claimants, 2) add a definition of coworker and/or the term coworker could be changed to "fellow worker."	**7/21/2008.** SPR changed the status of the finding to in abeyance awaiting NIOSH's changes. **4/28/2015.** SC&A reviewed the revised CATI form and found it to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 12

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Interviewers are trained to be sensitive, but procedure does not require facility knowledge. This can produce apprehension that procedure does not address.	**7/21/2008.** NIOSH stated that they have attempted to make the interviews less threatening by changing the wording in the interview letter.	**7/21/2008.** Based on NIOSH's response, SPR closed the finding.

ORAUT-PROC-0090 finding 13

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Procedure does not require interviewer training to elicit site-specific data.	**7/21/2008.** NIOSH and SC&A agreed that the aspects of this issue are captured elsewhere, and that this issue could be closed.	**7/21/2008.** SPR closed the finding.

ORAUT-PROC-0090 finding 14

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Interview contains numerous gaps: work hours per week; routine work duties; internal radiation dose; copies of dosimetry records; routine risking survey; rad area monitoring, rad surveys; radon monitoring; worker restrictions; incidents; medical x-rays; and coworker information.	**7/21/2008.** NIOSH will put together recommendations for changes to the CATI form, and SPR will do the same.	**7/21/2008.** SPR changed finding to in abeyance awaiting NIOSH changes. **4/28/2015.** SC&A reviewed the revised CATI form and found it to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 15

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Procedure does not provide for explanation if information is not used.	**7/21/2008.** The information collected via CATI is not used until the DR is performed. Only then will it be known what information from CATI will be used and how. While efforts are made to explain in the DR how information was used, this is not formalized as a procedure requirement.	**7/21/2008.** Based on NIOSH's response, SPR closed the finding.

ORAUT-PROC-0090 finding 16

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	DOE file not required to be with interviewer during interview.	**7/21/2008.** DOE dose record would be shown to the claimant at the closeout interview, not during the initial interview. NIOSH and SC&A agreed that this issue was covered by ORAUT-PROC-0092 and should be transferred to that review.	**7/21/2008.** SPR transferred the finding to PROC-0092.

PROC-0090 findings 17–20

- **Finding 17:** Procedure is not claimant favorable for family member claimants in the absence of preparation and requirement for coworker interview or detailed explanation of failure to interview.
- **Finding 18:** Interviewer training appears to be insufficient, at least in some cases. CATI has many gaps.
- **Finding 19:** No coworker interview requirement or explanation.
- **Finding 20:** Some aspects of interview process elicit detail while others do not.

Resolution to PROC-0090 findings 17–20

- NIOSH stated that these issues identified in the findings were addressed in previous findings 8 through 10 and finding 14.
- SC&A and SPR agreed, and SPR closed the finding at the July 28, 2008, meeting.

ORAUT-PROC-0090 finding 21

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Definitions and scope of key terms “completeness” and “technical content” not given.	**7/21/2008.** NIOSH stated that a revision to PROC-0090 will expand on the wording to make these terms clearer.	**7/21/2008.** SPR changed the finding to in abeyance awaiting NIOSH’s changes. **4/28/2015.** SC&A reviewed the revised PROC-0090 and found it to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 22

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	No reference to site profile or closing interview, no reference to dose file of claimant.	**7/21/2008.** NIOSH and SC&A agreed that this issue was covered by ORAUT-PROC-0092 and should be transferred to that review.	**7/21/2008.** SPR transferred finding to PROC-0092.

PROC-0090 findings 23–26

- **Finding 23:** No explicit connection to review information in closing interview is provided.
- **Finding 24:** No definition of key terms “completeness” and “technical content,” which can introduce arbitrariness and inconsistency.
- **Finding 25:** Reviewer qualifications are not specified in the procedure; reviewer not required to review claimant dose file; coworker interviews or explanations for not interviewing not required and therefore not reviewed.
- **Finding 26:** Process is implicitly biased against family member claimants because the standard of completeness is implicitly lower.

PROC-0090 findings 27–29

- **Finding 27:** CATI followup procedure dose not include some feedback mechanism from the interviewer regarding:
  - completeness and usefulness of information
  - whether the information was used
  - whether more information should be solicited from the claimant
- **Finding 28:** Reviewer not required to know site profile or claimant dose records. Basis for judging completeness and technical content of interview is not specified.
- **Finding 29:** Procedure does not specify scope of terms "completeness" and "technical content."

Resolution of PROC-0090 findings 23–29

- **7/21/2008:** NIOSH and SC&A agreed that these issues were discussed earlier, and the resolution was to change the language in PROC-0090.
- **7/21/2008:** SPR changed status of findings to in abeyance awaiting NIOSH's changes.
- **4/28/2015:** SC&A reviewed the revised PROC-0090 and found it to be acceptable. SPR closed the finding.

ORAUT-PROC-0090 finding 30

Finding date	Finding description	NIOSH response	Finding resolution
1/15/2005	Reviewer not required to review claimant DOE file.	**7/21/2008.** DOE dose record would be shown to the claimant at the closeout interview, not during the initial interview. NIOSH and SC&A agreed that this issue was covered by ORAUT-PROC-0092 and should be transferred to that review.	**7/21/2008**. SPR transferred the finding to PROC-0092.

Discussion of ORAUT-PROC-0090

ORAUT-PROC-0092, rev. 00

- Title: “Close-Out Interview Process”
- Rev. 00 issued August 17, 2005; rev. 01 issued April 10, 2012; rev. 02 issued February 2015
- Establishes program requirement for scheduling and performing a closeout interview
- SC&A reviewed PROC-0092 in September 2007
  - 9 findings identified in review
- SC&A’s review discussed at December 11, 2007, SPR meeting

PROC-0092 finding 1

The closeout interview procedure does not ensure that claimant concerns are fully addressed:

1) Procedure does not prescribe how claimant questions should be researched and how answers should be determined
2) Underlying data related to claimant concerns not examined in two cases reviewed by SC&A
3) Variable documentation of closeout interview process (some records fairly extensive, others brief)
4) Substantive claimant information not addressed by a dose reconstructor
5) HP Reviewers lack health physics qualifications and dose reconstruction experience, according to ORAUT managers

NIOSH agreed and provided response to PROC-0092 finding 1 parts 1–3

1) ORAUT-PROC-0092 has been reviewed and will be revised to reflect actions taken by reviewer staff when claimants have questions/concerns and/or provide additional information post DR. Due to uniqueness of each interview, no standard set of questions could cover all situations.
2) NIOSH will investigate two cases reviewed by SC&A; ORAUT-PROC-0092 will be reviewed to determine if clarifications are needed.
3) All telephone conversations are logged in NOCTS.
   - Communications staff reminded of information that should be recorded for the record.
   - This will be considered during the review and possible revision of ORAUT-PROC-0092.

NIOSH agreed and provided response to PROC-0092 finding 1 parts 4–5

4) When substantive claimant information is provided:
   - HP Reviewer determines if information was available for review prior to development of DR report.
   - HP Reviewer determines if the information was addressed.
   - OCAS agrees that closing interview procedure should be evaluated to specifically reflect current practice.
5) Standard qualifications for HP Reviewers are met upon hiring.
   - Reviewer staff receives training that includes dose reconstruction principles and methodology.
   - Reviewers are not considered health physicists.
   - The title “HP Reviewer” may be misunderstood; will consider using “Closeout Specialist“ in revision to ORAUT-PROC-0092.

Resolution to PROC-0092 finding 1 parts 1–5

- 4/28/2015 SPR meeting
  - PROC-0092 has been revised twice
  - SC&A has reviewed revised procedure and found it to be acceptable
- Subcommittee has closed this finding.

ORAUT-PROC-0092 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	The procedure makes no substantive provision for ensuring claimant understands the dose reconstruction and its implications for compensation prior to signing the OCAS-1 form, even when the claimant complains that they do not understand the language.	**12/11/2007.** 1) NIOSH needs to discuss appropriate wording with legal counsel regarding understanding the DR. 2) SC&A should provide NIOSH with suggestions to "personalize" wording.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 3

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	The fact that the signing of the OCAS-1 form occurs in the context of the closeout interview may create pressures on ORAUT personnel to get the signature before being certain that all issues of concern to the claimant have been fully addressed.	**12/11/2007.** NIOSH will incorporate changes into the procedure, which stops the clock on signing the OCAS-1 form until claimant's questions have been answered.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 4

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	Procedure does not ensure that claimant has all the information essential to the dose reconstruction prior to the closeout interview. This can hamper claimant in deciding whether or not to submit additional data or information at the closeout interview stage.	**12/11/2007.** NIOSH to change the wording of ORAUT-PROC-0092. SC&A to provide comments to NIOSH as to what needs to be changed and/or recommend changes.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 5

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	The term "Health Physics Reviewer" is misleading and connotes that the person has health physics qualifications, whereas that is not the case, according to ORAUT managers.	**12/11/2007.** This issue will be addressed under finding 1, part 5. NIOSH will revise the procedure.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 6

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	There is no requirement to connect the closeout interview with the CATI. The rationale for not using specific information provided from the CATI in the dose reconstruction is not required to be explained to the claimant.	**12/11/2007.** This issue will be addressed under finding 3. NIOSH will revise the procedure.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 7

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	Technical questions are not answered in real time. The unavailability of an HP in real time detracts from the process because the claimant cannot pursue a certain line of thinking. The problem is compounded by the fact that claimants usually do not have all the relevant documentation before them.	**12/11/2007.** This issue will be addressed under finding 2. NIOSH will revise the procedure.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 8

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	The procedure has no specific provision for responding to complaints about the difficulty that claimants have in understanding the DR report. The procedure allows for undue and substantial subjectivity in addressing technical information provided by claimants.	**12/11/2007.** This issue will be addressed under finding 2. NIOSH will revise the procedure.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

ORAUT-PROC-0092 finding 9

Finding date	Finding description	NIOSH response	Finding resolution
9/20/2007	No explicit connection to review the information in closing interview is provided.	**12/11/2007.** Some explanation for how the CATI information was used in the DR process will be provided at the closing interview stage. NIOSH will revise the procedure.	**12/11/2007.** SPR changed status to in abeyance awaiting PROC-0092 revision. **4/28/2015.** Closeout procedure revised and reviewed by SC&A and found to be acceptable. SPR closed the finding.

Discussion of ORAUT-PROC-0092

DCAS-PER-062, "ORAUT-OTIB-0052"

- Issued November 2017 to assess changes introduced in revisions 01 and 02 of OTIB-0052
- OTIB-0052 provides a correction factor that increases external dose if co-exposure data were used for construction trade workers (CTWs)
- Population of potentially impacted cases included 20 total sites where co-exposure data had been developed
- Only eight sites had no previous or forthcoming PER
- NIOSH reevaluated 1,006 cases that were impacted by the issuance of PER-062

SC&A's review of DCAS-PER-062

- SC&A reviewed PER-062 subtasks 1–3 in May 2018
- Review identified two observations
- Review presented to the SPR at the February 13, 2019, meeting

DCAS-PER-062 observation 1

Finding date	Finding description	NIOSH response	Finding resolution
5/31/2018	No documentation found that a co-exposure model is being developed or that a PER is forthcoming for Albany Research Center.	**2/13/2019.** NIOSH acknowledged that Albany Research Center should not have been included in table 3-1 (applicable site list). Therefore, there is no need for a forthcoming PER.	**2/13/2019.** Based on NIOSH's response, SPR closed the observation.

DCAS-PER-062 observation 2

Finding date	Finding description	NIOSH response	Finding resolution
5/31/2018	To ensure that appropriate OTIB-0052 guidance is applied to all cases evaluated under planned PERs for the 19 sites listed in DCAS-PER-062, SC&A should (1) maintain a list of these sites, (2) be informed when the PER is issued, and (3) review the PER to assess whether the selection of reworked cases will adequately capture all potential CTWs.	**2/13/2019.** No response required.	**2/13/2019.** SPR agreed with SC&A's recommendation and closed the observation.

DCAS-PER-062 subtask 4 review

- ABRWH selected the one reworked case with a POC between 45% and 50% for SC&A's review
- SC&A evaluated the reworked case in December 2021 to determine if external doses were correctly assessed in accordance with DCAS-PER-062

PER-062 case review process

- SC&A reviewed only the external dose components:
  - Recorded photon dose
  - Missed photon dose
  - Unmonitored photon dose
  - Unmonitored electron dose
- SC&A compared external original DR doses to the reworked external doses
- External doses increased as expected
- SC&A confirmed doses calculated correctly and was able to calculate a similar POC value
- SC&A had no findings or observations

Discussion of DCAS-PER-062

OCAS-PER-017, "Evaluation of Incomplete Internal Dosimetry Records from Idaho, Argonne–East and Argonne–West National Laboratories"

- Issued September 2007
- NIOSH determined in May/June 2006 that INL, ANL-W and ANL-E did not consistently provide all internal dose data in all EEs' dosimetry responses
- NIOSH identified cases impacted based on notations on the OCAS-INT-004 (check-box form), which met the following criteria:
  - Form marked as internal dosimetry records "provided" with or without a handwritten note stating, "no internal or recordable dose"
  - Form marked as internal dosimetry records "not readily available" with or without a handwritten note stating, "no internal or recordable dose"
  - Form had no markings or notations
- NIOSH submitted additional internal dosimetry requests for 223 cases
- A response was received for each request, and internal dose data were received for 62 cases from INL, 14 from ANL-W, 6 from ANL-E, and one from both INL and ANL-W for a total of 83 cases

SC&A's review of OCAS-PER-017

- SC&A reviewed PER-017 subtasks 1–3 in May 2012
- Review identified no findings or observations
- Review presented to the SPR at the July 31, 2012, meeting

OCAS-PER-017 subtask 4 review

- ABRWH selected 6 reworked cases:
  - 3 cases from INL
  - 2 cases from ANL-W
  - 1 case from ANL-E
- SC&A evaluated the reworked cases in April 2013:
  - Compared original internal dose to reworked internal dose
  - Determined if internal doses were correctly assessed using the EE's bioassay data

OCAS-PER-017 Case A (INL)

- Original internal dose calculated using maximizing hypothetical internal intake of 28 radionuclides (ORAUT-OTIB-0002) as an efficiency measure
- Reworked DR evaluated the single whole-body count (WBC) provided by DOE:
  - WBC results were less than limit of detection (LOD)
  - Overestimated exposure using limiting air concentration (ORAUT-OTIB-0018)
- Internal doses decreased 90% using bioassay data and overestimating assumptions
- SC&A confirmed doses calculated correctly
- SC&A had no findings or observations regarding Case A DR

OCAS-PER-017 Case B (INL)

- Original internal dose calculated using maximizing hypothetical internal intake of 28 radionuclides (ORAUT-OTIB-0002) as an efficiency measure
- Reworked DR evaluated the single WBC provided by DOE:
  - WBC results were less than LOD
  - NIOSH used a claimant-favorable approach and assigned maximizing hypothetical intakes
- No change in internal dose
- SC&A confirmed doses calculated correctly
- SC&A had no findings or observations regarding Case B DR

OCAS-PER-017 Case C (INL)

- Original DR assumed EE was not monitored for internal exposure; therefore, internal dose was calculated using environmental exposure
- Reworked DR evaluated the new bioassay data provided by DOE:
  - EE submitted several urine samples and WBCs
  - All results were less than minimum detectable activity (MDA)
- Missed internal doses calculate using:
  - One-half gross beta urine sample for period that coincided with monitoring
  - One-half gross gamma urine sample for period that coincided with monitoring
  - One-half LOD value for WBCs
- Recalculated internal dose alone was sufficient to consider DR complete
- SC&A confirmed doses calculated correctly
- SC&A had no findings or observations regarding Case C DR

OCAS-PER-017 Case D (ANL-W)

- Original internal dose calculated using maximizing hypothetical internal intake of 28 radionuclides (ORAUT-OTIB-0002) as efficiency measure
- Reworked DR evaluated the new bioassay data provided by DOE:
  - EE submitted urine sample and WBCs
  - All results were less than MDA
- Missed internal doses calculated using:
  - Cs-137 intake estimated using one-half LOD value for WBC assuming a chronic intake over entire employment period
  - Sr-90, Pu-239, and Ce-144 derived using ratios from ANL-W TBD
  - Type Super S plutonium was assumed
- Recalculated internal dose was 14% less than original internal dose
- SC&A confirmed doses calculated correctly
- SC&A had no findings or observations regarding Case D DR

OCAS-PER-017 Case E (ANL-W)

- Original DR assumed EE was not monitored for internal exposure; therefore, internal dose was calculated using environmental exposure
- Reworked DR evaluated the new bioassay data provided by DOE:
  - EE was monitored via WBCs
  - All results were less than MDA
- Missed internal doses calculated using:
  - Overestimating exposure to limiting air concentration (ORAUT-OTIB-0018)
- Recalculated internal doses increased by 66% (cancer 1) and 34% (cancer 2)
- SC&A confirmed doses calculated correctly
- SC&A had no findings or observations regarding Case E DR

OCAS-PER-017 Case F (ANL-W)

- Original DR assumed EE was not monitored for internal exposure; therefore, internal dose was calculated using limiting air concentrations (ORAUT-OTIB-0018)
- Reworked DR evaluated the new bioassay data provided by DOE:
  - EE submitted urine samples
  - Samples analyzed for gross beta, gross gamma, gross alpha, and uranium

OCAS-PER-017 Case F (ANL-W) dose calculations

- Gross beta/gross gamma (several urine samples, all below MDA values):
  - Dose calculated using ORAUT-OTIB-0054 and assuming chronic exposure to Sr-90, type F, during entire employment period
- Gross alpha (several in vitro samples, all below MDA values):
  - Assumed a chronic intake of type M, Pu-239 based on one-half MDA throughout employment
  - Assumed chronic intakes of associated radionuclides using ratios in TBD
- Uranium (several urine samples, all below MDA values, 1 greater than MDA value)
  - Missed uranium dose based on chronic exposure to U-234 at one-half MDA level during appropriate monitoring period
  - Fitted (positive) uranium dose calculated assuming acute intake of U-234, type S on date of bioassay (<0.001 rem and not included)
- Internal Environmental Exposure
  - Based on onsite ambient dose values from ANL-E TBD

SC&A review of OCAS-PER-017 Case F (ANL-W)

- Recalculated internal doses decreased by ~97%
- SC&A found NIOSH's assumptions and approach to reassessing internal dose to be reasonable
- SC&A confirmed NIOSH appropriately applied guidance in OTIB-0054 and ANL-E TBDs
- All dose data were correctly entered in IREP
- SC&A had no findings or observations regarding Case F DR

Discussion of OCAS-PER-017