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

Kathleen Behling, SC&A, Inc.

Advisory Board on Radiation and Worker Health,
Subcommittee for Procedure Reviews

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SPR-approved documents

- OCAS-TIB-009, rev. 0, “Estimation of Ingestion Intakes”/NIOSH-OVER-0002, rev. 0, “Workplace Ingestion”
- ORAUT-PROC-0031, rev. 01, “DOE Technical Basis Document Development, Review, and Approval Process”
- ORAUT-OTIB-0083, rev. 00, “Dissolution Models for Insoluble Plutonium-238,” superseded by DCAS-RPT-005, rev. 01, “Alternative Dissolution Models for Insoluble Pu-238”
- OCAS-PER-020, rev. 0, “Blockson TBD Revision”
- OCAS-PR-007, rev. 1, “Dose Reconstruction Review”

Matrix-style presentation approach

- At the April 14, 2021, Board meeting, the SPR presented their approach for closing out SPR-approved documents
- Issue resolution matrix approach was agreed upon:
  - Summary description of document reviewed
  - Inclusion of a table listing:
    - Description of document review findings/observations
    - Chronology of NIOSH, SC&A, and SPR discussions to resolve issue
    - Summary of final finding/observation resolution
- Matrix approach only for less complex documents
- OCAS-TIB-009/NIOSH-OVER-002 are not suitable for this matrix-style approach

OCAS-TIB-009, rev. 0

- Title: “Estimation of Ingestion Intakes”
- Issued April 13, 2004
- Provides approach to estimating ingestion intakes for workers without bioassay monitoring data
- Used to estimate ingestion intakes during both operational and residual contamination periods
- Relies on ambient air concentration measurements to estimate the amount of daily ingestion in the workplace

SC&A's review of OCAS-TIB-009

- SC&A reviewed OCAS-TIB-009 in June 2006
- SC&A identified a set of related findings associated with surface contamination:
  - Surface contamination levels are likely orders of magnitude higher than predicted by the settling velocity of airborne contaminants assumed at 5 microns
  - NIOSH's assumption that equilibrium is reached in a 24-hour period is without scientific basis and unconservative
  - Surface contamination may also result from milling, grinding, cutting, welding, liquid spills, etc.

SC&A's modeled transfer findings

- SC&A identified a set of related findings associated with modeled transfer:
  - Modeled transfer of surface contaminations to the mouth that assumes a 10% transfer from the surface area of one hand during a full workday appears unrealistic and unconservative
  - Ingestion may involve other modes of intake, such as direct deposition on lips, smoking of cigarettes, etc.

SC&A's review of OCAS-TIB-009: Finding 1

- SC&A findings later consolidated into the BRS as TIB-009 finding 1
- **BRS TIB-009 finding 1:** The fundamental scientific approach to reconstructing ingestion exposures has flaws that could lead to an underestimate of ingestion doses under certain circumstances
- SPR determined that this TIB-009 finding was an overarching issue
- NIOSH issued NIOSH-OVER-0002, rev. 00, "Workplace Ingestion," October 26, 2012

NIOSH's response to SC&A's TIB-009 review

- NIOSH prepared a white paper on SC&A's TIB-009 findings and presented its results at the November 1, 2012, SPR meeting
- NIOSH concurred that parameters used in the TIB-009 model are based on assumptions that have not been empirically demonstrated to be valid
- NIOSH characterized SC&A's findings into two issues:
  - **Issue 1:** The possible lack of an association between measured air concentrations in the workplace and surface contamination
  - **Issue 2:** The modeled transfer of the surface contamination to the GI tract through inadvertent ingestion

NIOSH on issue 1: Relationship between air and surface contamination levels

- NIOSH analyzed air and smear sampling from:
  - Simonds Saw and Bethlehem Steel uranium rolling operations
  - Superior Steel during a test rolling
  - Vitro Manufacturing (~240 air samples and 150 contamination smears)
- Paired data were plotted and showed measured surface contamination levels are proportional to air contamination
- Linear regression analysis showed estimated level of surface contamination (dpm/m^2) equals 116.7 times measured air concentration (dpm/m^3)

NIOSH on issue 2: Determine daily ingestion rate for loose surface contamination

- NRC computer program RESRAD-BUILD has an ingestion parameter based on an extensive review and analysis of the literature
- In this model, the hourly ingestion rate (dpm/h) equals the surface contamination measured in the workplace (dpm/m^2) times effective transfer rate for ingestion of removable contamination (m^2/h)
- NUREG/CR-5512, volume 3, considered the average value of 1.1×10^{-4} m^2/hr (corresponding to an ingestion of about 0.5 mg/day) to represent the default ingestion transfer rate
- Corresponding ingestion rate for an 8-hour workday would be 8.8×10^{-4} m^2/d

Relationship between air concentration, surface contamination, and default daily ingestion

- Using the NIOSH-derived surface contamination level (116.7) and NUREG/CR-5512 default ingestion value (8.8×10^{-4} m^2/d) results in daily ingestion of 0.103 times measured air concentration in workplace
- TIB-009 guidance recommends a daily ingestion of 0.2 times measured air concentration in workplace

NIOSH conclusion on TIB-009 guidance

- Using empirical data and NUREG/CR-5512 default ingestion rate, ingestion intake predictions are approximately half those recommended in TIB-009
- Although TIB-009 parameters and assumptions were somewhat simplistic, the model produces estimates of ingestion in reasonable agreement with the NUREG predictions
- TIB-009 also includes a 20% multiplier for a contaminated beverage or food item, not considered in the NUREG
- Given the uncertainty inherent in the values, it is not unreasonable for NIOSH to continue using the TIB-009 approach for estimating intakes

Additional NIOSH ingestion considerations

- Using TIB-009, ingestion will be a fraction of the inhalation exposure (1 dpm/m^3 of air activity results in daily inhalation and ingestion exposures of 9.6 dpm/day and 0.2 dpm/day, respectively)
- For uranium intakes, uptake across the gastrointestinal (GI) tract is low
- Ingestion pathway contributes less than 0.6% to the dose for soft tissues under all solubility types
- Maximum contribution for ingestion would be to organs of the GI tract, with highest dose of 3.4% to the lower large intestine assuming inhalation of Type S material
- For ingestion dose, NIOSH applies a geometric standard deviation (GSD) of 3; in some cases, a GSD of 5 is applied

NIOSH on using TIB-009 guidance for residual period

- TIB-009 has been improperly applied during the residual period
- After Atomic Energy Commission operations, estimating air concentration using a resuspension factor (e.g., $1x10^{-6}/m$) and multiplying that value by 0.2 to calculate a daily ingestion intake would grossly underrepresent airborne activity that would deposit the surface contamination
- To apply TIB-009 during residual periods, air concentration on the first day of the residual contamination period should be equal to that present at the end of operations
- Thereafter, ingestion can be decreased over time using ORAUT-OTIB-0070 source depletion techniques
- NIOSH will comprehensively review estimation of ingestion during the residual contamination period at all sites and issue PERs as appropriate

SC&A's response to NIOSH's TIB-009 ingestion assessment

November 1, 2012, SPR meeting, SC&A identified:

- Majority of data on inadvertent ingestion from hand-to-mouth behavior are in residential setting and may not represent industrial environment
- Data in NUREG-5512 and RESRAD came from Pacific Northwest Laboratory and represent one set of data
- An independent EPA study on World Trade Center (WTC) workers used a model for transferring pesticides hand to mouth
  - EPA study found on soft surfaces ingestion was 2.25 cm^2/hr, which agrees with NIOSH
  - EPA's hard surface values were 11.25 cm^2/hr

NIOSH's response to WTC study

On January 4, 2013, NIOSH responded to WTC study:

- EPA document was developed to identify contaminants of primary health concern in support of planned residential cleanup efforts
- Methodology oriented toward screening analysis of exposures to residents in vicinity of WTC and not toward quantification of exposure to WTC cleanup workers
- Considering this, DCAS believes that occupational ingestion parameters in RESRAD document remain the best set of data to estimate ingestion exposures under EEOICPA

Closure of BRS finding 1 for TIB-009 and OVER-0002

- SC&A concluded:
  - Considering (1) the differences between the WTC study and TIB-009 and (2) all the uncertainties involved, the amount of agreement between the hand-to-mouth effective transfer rates is reasonable
  - Difference in hand-to-mouth ingestion model between workers and residents is exposure durations assumed, not the effective transfer rates
- SC&A therefore recommended closure
- Considering all discussions, SPR closed TIB-009 and OVER-0002 finding 1 at the February 5, 2013, meeting

Discussion on TIB-009/OVER-002

ORAUT-PROC-0031

- Rev. 01, “DOE Technical Basis Document Development, Review, and Approval Process,” issued December 15, 2005
- Rev. 02, “Site Profile and Technical Basis Document Development,” issued August 17, 2007
- Establishes guidelines for the development, review, and approval of site profile technical basis documents (TBDs)
- Content is procedural rather than technical

SC&A's review of PROC-0031

- SC&A's review of rev. 0 submitted June 8, 2006
- SC&A review of rev. 01 submitted August 3, 2007
- Review conducted in accordance with "SC&A's Procedure to Perform QA Reviews of NIOSH/ORAU Dose Reconstruction Procedures," rev. 0, April 12, 2004
- Review used QA-related document compliance checklist
- SC&A identified three findings

Issue resolution for PROC-0031 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	Section 4.2.1 appears to incorrectly reference other sections in the procedure. The correct reference should be: “Sections 6.3.10 through 6.3.15.”	**8/24/2007.** NIOSH agrees. This error was corrected through a page change to the procedure.	**11/2/2007.** Issue resolved to the satisfaction of the Subcommittee and the finding was closed.

Issue resolution for PROC-0031 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	Section 4.2.7 refers to "sensitive information" but does not define what is meant by that term. The definition section (section 9.0) likewise does not define that term.	**8/24/2007.** "Sensitive information" as used in this Procedures is a general, collective description of information that has limited or restricted access and distribution due to various laws, regulations, and agency orders, i.e., Privacy Act, DOE Order 471.1A (Unclassified Controlled Nuclear material), DOE Order 471.3 (Official Use Only Information), etc.	**11/2/2007.** Issue resolved to the satisfaction of the Subcommittee and the finding was closed.

Issue resolution for PROC-0031 finding 3

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure covers TBD revision reflecting comments from NIOSH and worker outreach activities but does not mention those received from reviews by the Advisory Board or its contractors. Are they assumed to be NIOSH comments?	**8/24/2007.** Yes. NIOSH forwards comments from the Advisory Board and its contractors to ORAU for response and followup.	**11/2/2007.** Issue resolved to the satisfaction of the Subcommittee and the finding was closed.

PROC-0031 followup

- November 1, 2012, SPR requested SC&A to perform a pre-review of PROC-0031, rev. 03
- SC&A submitted its pre-review report on January 25, 2013
- SC&A concluded:
  - Revision contained no material technical changes
  - Revision is substantial improvement over earlier version with more clarity and details
- July 9, 2013, SPR concluded that a re-review of PROC-0031 was not required and added a note to the BRS to that effect

Discussion on PROC-0031

ORAUT-OTIB-0083

- Rev. 00, “Dissolution Models for Insoluble Plutonium-238,” issued April 12, 2013
- OTIB reviews two specific examples of nonstandard urinary excretion patterns following intakes of ceramic forms of Pu-238 and provides parameters for their use in IMBA
- Energy employees (EEs) exposed to this ceramic form of Pu-239 exhibit non-monotonic urinary excretion, where there is a length of time the urine shows nothing and thereafter it goes back to be excreted
- OTIB cancelled and replaced by DCAS-RPT-005 in 2016

SC&A's review of ORAUT-OTIB-0083

- Review submitted December 24, 2013
- Review identified 14 findings
- Findings discussed at February 13, 2014, SPR meeting

OTIB-0083 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	The applicability and target audience of ORAUT-OTIB-0083 is not well defined	**2/13/2014.** This is an administrative finding that NIOSH can address as appropriate.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	NIOSH did not demonstrate that Type J plutonium is a material that would be rarely encountered in the workplace.	**2/13/2014.** Type J Pu has only been observed at LANL. When Pu is incorporated into a ceramic matrix material, it displays a protracted period of increasing solubility over time, then decreases. Although this material was present at Mound, no instances of inhalation.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 3

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	NIOSH does not explain why Type L was chosen to evaluate the doses for certain scenarios, as exemplified in tables 2-1 and 2-2. Type L was derived based on a singular incident that occurred at Mound in 1960.	**2/13/2014.** Type L model was based on 5 cases with individual bio-variability. SC&A's example case that does not fit Type L may have involved an EE with a chronic exposure. NIOSH will prepare a future written response.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 4

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	NIOSH did not demonstrate that Type L was commonly found in the workplace at Mound or at any other places. **2/13/2014.** SC&A responded by stating its concern in this finding is whether the OTIB will be used at other sites.	**2/13/2014.** NIOSH considered this finding similar to finding 3. TIB actually instructs dose reconstructors to use Type L under certain circumstances. NIOSH does not understand issue.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 5

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	NIOSH did not demonstrate that exposures at Mound to Pu-238 that show non-monotonic absorption from the lungs may be well-characterized by Type L Pu-238 at all times and at all areas.	**2/13/2014.** NIOSH will provide a future response to finding.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 6

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	NIOSH does not state whether the technical calculations to derive the limiting dissolution types should stand as examples of similar calculations to be performed for other facilities besides Mound.	**2/13/2014.** NIOSH stated that it is implied that OTIB-0083 will be used at other facilities but agrees OTIB does not adequately describe the basis for its use at other facilities.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 7

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	NIOSH does not compare organ doses from acute intakes of Type L Pu-238 with chronic intakes of Types M and S Pu-238 materials. NIOSH should discuss the limiting dissolution types for acute intakes of Type L versus chronic intakes of Type M or Type S Pu-238, as this is an important problem in dose reconstruction.	**2/13/2014.** NIOSH does not understand basis for finding but will address the finding in the context of SC&A's report.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 8

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	In section 4, NIOSH defines the parameters for Type L exposures at Mound and compares the dissolution curves with Type J and Type S, but does not demonstrate that Type L is typical of Mound exposures.	**2/13/2014.** NIOSH will discuss and demonstrate that the Type L solubility is adequately bounding. NIOSH will provide written response.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 9

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	The purpose of section 4 is not well defined in relation to other exposures to Pu-238 that show non-monotonic behavior at Mound and at other sites.	**2/13/2014.** NIOSH will provide written response to finding.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 10

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	There is no guidance in either ORAUT-TKBS-0016-5, rev. 02, or OTIB-0083 on which areas of Mound and in which time period tables 2-1 and 2-2 should be used. The lack of such guidance implies that the tables should be used at all areas and at all times to interpret Mound Pu-238 bioassay results.	**2/13/2014.** NIOSH stated that it is their intent to use the table values for all areas and all times for all plutonium intakes.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 11

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	There is no assurance that the Pu-238 material at other sites will correspond to Mound's Type L PU-238 lung dissolution pattern. There is no information in OTIB-0083 on how to deal with exposures to Pu-238 material that present lung dissolution parameters different from Types M, S, and L.	**2/13/2014.** NIOSH will address finding in future written response.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 12

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	OTIB-0083 is difficult to follow and understand. The sections do not follow a natural order. NIOSH's Type J and Type L Pu-238 compounds are only introduced in section 4, although they are used in sections 1, 2, and 3.	**2/13/2014.** NIOSH will take this finding under consideration as they are providing these responses.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

OTIB-0083 finding 13

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	OTIB-0083 is essentially the same document as the white paper, “Modeling Intakes of Pu-238 at Mound.” OTIB-0083 is only clear for those that participated in discussions about Pu-238 exposures at Mound.	**2/13/2014.** It was discussed that this is an editorial comment about clarity of the document. It will be taken into consideration in the response. Also, this may be an observation rather than finding.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting. The SPR also determined that the issue will remain a finding awaiting NIOSH’s response.

OTIB-0083 finding 14

Finding date	Finding description	NIOSH response	Finding resolution
12/24/2013	OTIB-0083 does not discuss the existence of other non-monotonic forms of Pu-238 at Mound, nor present any research done to prove Type L is the only appropriate form of Pu-238 to be included in the calculation of the limiting dissolution type.	**2/13/2014.** NIOSH considers this proving a negative issue. OTIB does demonstrate why this is not considered to be a reasonable incident at Mound. NIOSH will reiterate issue in response.	**2/13/2014.** SPR requested that NIOSH provide followup actions at a future SPR meeting.

NIOSH followup response about OTIB-0083 at August 28, 2014, SPR meeting

- NIOSH agrees with SC&A's comment that target audience not well defined.
- NIOSH agrees with concerns about applicability of the Type L model developed using 5 Mound cases.
- NIOSH will rebuild model based on additional cases at Mound.
- NIOSH will demonstrate that the Type L exposures are standard anywhere Pu-238 is handled.
- NIOSH will add section that defines scope and specifically under which exposure conditions we can expect Type L material to be present.

SPR discussions about OTIB-0083 at the November 25, 2014, meeting

- NIOSH will evaluate at which sites this Pu-238 may have existed.
- Planning on doing a complete rewrite of OTIB-0083.
- On NIOSH's project planning chart for review in the May 2015 timeframe, with completion in August 2015.
- NIOSH will inform SPR when rewrite complete.
- Thereafter, SC&A will be tasked with review.

DCAS-RPT-005

- Rev. 00, “Alternative Dissolution Models for Insoluble Pu-239,” issued June 30, 2016, replaced ORAUT-OTIB-0083
- Rev. 01 issued August 17, 2018
- Provides guidance on the evaluation of intakes for workers who were exposed to insoluble ceramic forms of Pu-238
- LANL, Mound, SRS, and NUMEC only sites with unencapsulated insoluble Pu-238
- Site-specific dissolution models developed for Mound and LANL

SC&A's review of RPT-005, rev. 00

- Review submitted January 13, 2017.
- Assessment of RPT-005 resulted in SC&A recommending that all 14 findings on OTIB-0083 be closed:
  - RPT-005 clearly defines the target audiences and DOE and AWE sites that had the potential for exposure to this form of plutonium.
  - RPT-005 refers to the application of lung model "Type L" at Mound and other sites; NIOSH now differentiates the sites (LANL, SRS, NUMEC, and Mound). For Mound in particular, data from various incidents are used to derive the most suitable model for Pu-238 to be applied in the installation.
  - RPT-005 now specifies how alternative dissolution models for Pu-238 should be applied to different installations.
  - Findings 7, 8, 12, and 13 no longer apply to RPT-005.
- Review did identify two new findings.

RPT-005 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
01/13/2017	NIOSH should provide justification for using Mound Case 13 dissolution parameters as the default for all Mound workers. **2/26/2019**. SC&A submitted a memo indicating it reviewed DCAS-RPT-005, rev. 01, and considers their justification for using Case 13 adequate. Recommends closure.	**11/13/2017.** NIOSH will add explanation in next revision. **10/17/2018.** NIOSH issued RPT-005, rev. 01, which added clarification as to why Case 13 represents all Mound workers.	**11/13/2017.** Due to the nature of this concern, the finding was changed to an observation. SPR put it in abeyance awaiting RPT revision. **2/18/2021.** SPR closed observation.

RPT-005 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
01/13/2017	The use of Mound Case 13 parameters as a default for SRS workers contradicts the more claimant-favorable statement that the LANL model should be used for SRS cases.	**11/13/2017.** NIOSH agrees that the statement is in error and will be corrected through the issuance of a page change notice. **10/17/2018.** NIOSH issued RPT-005, rev. 01, which corrects the error.	**11/13/2017.** Due to the nature of this concern, the finding was changed to an observation. SPR put it in abeyance awaiting RPT revision. **2/13/2019.** NIOSH has revised report and corrected error on using Mound-13 for SRS. SPR closed observation.

Discussion on RPT-005

OCAS-PER-020, rev. 0

- Title: “Blockson TBD Revision”
- Issued July 31, 2007
- Determines the effect of revision 01 to the Blockson Chemical Company TBD (OCAS-TKBS-0002)
- Revision impacted several exposure pathways:
  - Inclusion of non-uranium activities in dose reconstruction
  - Revised intakes for uranium extraction in building 55
  - Revision to radon exposure estimates
  - Revisions to doses from residual contamination

SC&A's review of PER-020, rev. 0

- Review issued March 23, 2009
- Identified three findings
- SC&A presented review to the SPR at the March 22, 2011, meeting

PER-020 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
3/23/2009	NIOSH's assigned solubility class Type M for uranium and its use for converting urine excretion data to inhalation quantities for building 55 may be inappropriate.	**3/22/2011.** Finding discussed and determined to be complex and specific to the Blockson site profile rather than the PER. **7/31/2012.** NIOSH reports that there is no reason to believe that there is anything other than Type M solubility at Blockson. SC&A agrees.	**3/22/2011**. SPR decided that the Blockson Work Group should be reconstituted for the purpose of resolving this finding. SPR requested that NIOSH investigate the impacts of this issue and report back to the Subcommittee. **7/31/2012**. SPR closed finding.

PER-020 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
3/23/2009	NIOSH's assigned f_1 value of 0.02 for uranium and its use for converting urine excretion data to inhalation/ingestion quantities may be inappropriate.	**3/22/2011.** Finding discussed and determined to be complex and specific to the Blockson site profile rather than the PER. **7/31/2012.** NIOSH reports that there is no reason to believe that there is anything other than Type M solubility at Blockson. SC&A agrees.	**3/22/2011.** SPR decided that the Blockson Work Group should be reconstituted for the purpose of resolving this finding. SPR requested that NIOSH investigate the impacts of this issue and report back to the Subcommittee. **7/31/2012.** SPR closed finding.

PER-020 finding 3

Finding date	Finding description	NIOSH response	Finding resolution
3/23/2009	The assigned radon exposure value of 0.112 wlm/year as a bounding value for Blockson may be inappropriate.	**3/22/2011.** An SEC has been awarded at Blockson, which states radon exposures cannot be modeled. Therefore, this finding is moot.	**3/22/2011.** Based on the issuance of the Blockson SEC, the SPR closed the finding.

SC&A's subtask 4 review of PER-020, rev. 0

- Two cases were selected for review
- Both cases were reworked after TBD revision 02 was issued in November 2007
- Subtask 4 report issued October 15, 2013
- SC&A identified three findings
- Review presented to SPR at November 13, 2013, meeting

Subtask 4 case overview

- EEs for both cases worked at Blockson for many years
- Neither of the EEs were monitored for exposure
- Both EEs were diagnosed with a qualifying cancer during employment
- SC&A compared original and reworked dose
- As expected, external and internal doses increased in both cases
- SC&A's assessment to determine if reworked cases were performed in accordance with TBD revision resulted in three findings

PER-020 finding 4 (subtask 4)

Finding date	Finding description	NIOSH response	Finding resolution
10/13/2013	Internal dose calculation inconsistent with guidance in OCAS-TKBS-0002, rev. 02. Internal doses calculated for stomach based on inhalation pathway. Guidance specifies doses should be calculated using the ingestion pathway for cancers associated with organs/tissues of the GI tract.	**11/7/2013.** NIOSH agrees. NIOSH re-reviewed all the cases that had GI tract cancers and found there were six cases that had been done incorrectly, since they did not use ingestion. Four were compensated under SEC. Two were reworked but no change in compensation decision.	**11/7/2013.** Based on NIOSH's reassessment of all impacted cases, the SPR closed finding.

PER-020 finding 5 (subtask 4)

Finding date	Finding description	NIOSH response	Finding resolution
10/13/2013	Calculation of inhalation dose was not consistent with OCAS-TKBS-0002, rev. 02, guidance. Inhalation dose only considered intakes from Th-232, U-234, and U-238, rather than all 12 radionuclides identified in TBD. **4/16/2014.** SC&A reviewed the tool and finds it acceptable.	**11/7/2013.** NIOSH agrees. NIOSH reviewed the case and determined that the inhalation dose had been completed with an old version of the Building 55 Inhalation Tool. Tool has been revised.	**11/7/2013.** SPR tasked SC&A with reviewing the revised tool. **4/16/2014.** Based on SC&A's review, SPR closed the finding.

PER-020 finding 6 (subtask 4)

Finding date	Finding description	NIOSH response	Finding resolution
10/13/2013	Identification of a potential error in the Blockson Bldg. 55 Inhalation Tool. **4/16/2014.** SC&A reviewed the tool and finds it acceptable but identified discrepancy between tool instructions and TBD. **11/25/2014**. SC&A reviewed the modified TBD and agrees that the changes address the finding.	**11/7/2013.** NIOSH reviewed the case and determined that the inhalation dose had been completed with an old version of the tool. Tool has been revised **4/16/2014.** NIOSH agreed to modify the TBD to agree with the latest version of the tool.	**4/16/2014.** Based on SC&A's review, SPR changed finding status to in abeyance awaiting TBD change. **11/25/2014.** Based on SC&A's TBD review, SPR closed the finding.

Discussion of PER-020

OCAS-PR-007, rev. 1

- Title: “Dose Reconstruction Review”
- Issued April 14, 2005
- Provides guidance to OCAS personnel involved in assessing performance of contractor, contractor personnel, and self-assessments related to dose reconstruction under 42 CFR Part 82
- NIOSH quality assurance and quality control procedure

SC&A's review of OCAS-PR-007, rev. 1

- SC&A first submitted its review of rev. 1 on June 8, 2006
- SC&A resubmitted its review of rev. 1 on August 3, 2007, with no additional findings
- Review conducted in accordance with "SC&A's Procedure to Perform QA Reviews of NIOSH/ORAU Dose Reconstruction Procedures," rev. 0, April 12, 2004
- Review used QA-related document compliance checklist
- SC&A identified nine findings

PR-007 finding 1

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure needs to clarify the authority that establishes the frequency for performing the three different types of reviews. **8/29/2008.** SC&A reviewed PR-007, rev. 2, and confirmed the procedure was modified as stated by NIOSH. Recommended closure.	**11/7/2007.** This document was revised on 2/16/2007. There are now two levels of review. NOCTS is programmed such that 5% of the DRs reviewed are randomly selected to undergo detailed review.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 2

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The role of the Contract Oversight Team Leader should be delineated in section 4.0. **8/29/2008.** SC&A reviewed PR-007, rev. 2, and confirmed the procedure was modified as stated by NIOSH. Recommended closure.	**11/7/2007.** This document was revised on 2/16/2007. The Contract Oversight Team leader has no specific responsibilities in this procedure.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review, the SPR closed the finding, and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 3

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure is not clear on how the cases are chosen for review. **8/29/2008.** SC&A reviewed PR-007, rev. 2, and found that the revised document makes it clear how the cases are chosen for review. As such, SC&A recommends that this issue be closed.	**11/7/2007.** This document was revised on 2/16/2007. Every DR is reviewed according to the requirements of section 5.1.1, Basic Review and Approval. 5% of all DRs reviewed are selected at random, automatically by NOCTS.	**8/21/2008**. SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 4

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure mentions training for Health Physics personnel reviewers but does not reference the procedure covering the "training process." **8/29/2008.** SC&A reviewed PR-007, rev. 2, and confirmed the procedure was modified as stated by NIOSH. Recommended closure.	**11/7/2007.** This document was revised on 2/16/2007. There are no training requirements in this document.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 5

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure does not reference OCAS -PR-005 for basic reviews (section 5.1.1) or for detailed reviews (section 5.1.2). **8/29/2008.** SC&A reviewed PR-007, rev. 2, and confirmed the procedure was modified as stated by NIOSH. Recommended closure.	**11/7/2007.** This document was revised on 2/16/2007. This is a stand-alone document. OCAS-PR-005 is referenced in section 3.0 references.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 6

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure should provide guidance on what is meant by a “significant overestimate.” **8/29/2008.** SC&A reviewed PR-007, rev. 2, and confirmed the procedure was modified as stated by NIOSH. Recommended closure.	**11/7/2007.** This document was revised on 2/16/2007. The term “significant overestimate” does not appear in the current revision.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A’s review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 7

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	The procedure should not be limited to “radiological workers.” **8/29/2008.** SC&A reviewed PR-007, rev. 2, and confirmed the procedure was modified as stated by NIOSH. Recommended closure.	**11/7/2007.** The procedure is not limited to radiological workers. The term “radiological worker” appears in the section that describes the likelihood of exposure.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A’s review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 8

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	It is suggested that the Record of Issue/Revisions provide more detailed information, and that revised sections are denoted. **8/28/2008.** NIOSH maintains historical records of procedures; it is not practical to note in the procedure's Record of Issue/Revision table details of revisions. SC&A recommends that this issue be closed.	**11/7/2007.** This is a good suggestion. Historical versions of procedures are maintained.	**8/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

PR-007 finding 9

Finding date	Finding description	NIOSH response	Finding resolution
6/8/2006	It would be helpful to the reader to include an acronym section in the procedure. **8/28/2008.** SC&A reviewed PR-007, rev. 2, and found that NIOSH did not include an acronym section, although the NIOSH response thought it is a good suggestion to do so. This is not an important issue. SC&A recommends that this issue be closed.	**11/7/2007.** This is a good suggestion.	**11/21/2008.** SPR asked SC&A to review the revision and, if there were no additional issues, the finding could be closed. Based on SC&A's review and recommendation, the SPR closed the finding and the BRS was updated 10/14/2008, as specified by SPR.

Discussion of PR-007