



# SC&A's Evaluation of ORAUT-OTIB-0088, Revision 01, "External Dose Reconstruction"

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# ORAUT-OTIB-0088, revision 01, “External Dose Reconstruction”

- ◆ Revision 00 issued in 2018
- ◆ Revision 01 issued in 2019
  - Advisory Board on Radiation and Worker Health tasked SC&A with review of revision 01 on March 15, 2021
  - SC&A issued review of revision 01 on September 3, 2021
- ◆ Revision 02 issued June 11, 2021
  - SC&A not yet tasked to review revision 02

# Purpose of OTIB-0088, revision 01

- ◆ To provide external dose reconstruction guidance using:
  - OCAS-IG-001
  - Approved technical information bulletins and site profiles
  - ORAUT procedures
- ◆ For exposure to photons, neutrons, electrons, ambient dose, and x-rays

# Outline of OTIB-0088, revision 01

- ◆ General approach to:
  - External dosimetry records
  - Occupational medical x-ray dose
  - Incident investigation reports
  - Types of external radiation exposures
  - Conversion of external dose to organ dose
  - Uncertainty
- ◆ Attachments
  - Attachment A: Assigning missed dose
  - Attachment B: Onsite ambient dose
  - Attachment C: DOE adoption of ICRP Publication 60 neutron weighting factors by site

# SC&A's review of the approach used in OTIB-0088, revision 01

- ◆ SC&A evaluated NIOSH's OTIB-0088 approach to assigning external dose and found it reasonable and useful
- ◆ SC&A had no findings or observations concerning the approach used in OTIB-0088

# SC&A's review of the methods used in OTIB-0088, revision 01

- ◆ SC&A concurs with NIOSH's methods, equations, and recommendations in OTIB-0088
- ◆ However, SC&A's previous review (SC&A, 2019) of OTIB-0088, revision 00 (NIOSH, 2018), did have an observation concerning the lack of information in OTIB-0088, revision 00, if it is used to facilitate cancellation of ORAUT-PROC-0060, "Occupational Onsite Ambient Dose Reconstruction for DOE Sites," revision 01 (NIOSH, 2006)

# Observation 1: Path forward for PROC-0060 data in OTIB-0088

- ◆ Observation 1 discussed during the Subcommittee for Procedure Reviews meeting of February 13, 2019 (ABRWH, 2019, pp. 87–91)
- ◆ The subcommittee closed SC&A's (2019) observation 1 with the understanding that NIOSH would consider SC&A's recommendation further and issue an email with a path forward
- ◆ SC&A is not aware of NIOSH issuing an email addressing SC&A's concern with the cancellation of ORAUT-PROC-0060

# SC&A's review of the documentation used in OTIB-0088, revision 01

- ◆ SC&A evaluated documentation in OTIB-0088 and found the previous calculational error in attachment A has been corrected in revision 01
- ◆ However, SC&A did note several areas that would benefit from further clarification or explanation, which are listed as four observations as discussed in the following slides

# Observation 2: Clarification of covered x-ray examinations

- ◆ The first paragraph of page 8 states:
  - “Only doses that were received before the diagnosis of the primary cancer are included in the dose reconstruction.”
  - “If the worker received medical X-ray examinations for occupational health screening and as a condition of employment at a covered site, dose reconstruction includes those doses.”
- ◆ It would be clarifying if the statement included the fact that x-ray examinations that were performed for diagnostic or therapeutic reasons are excluded.

# Observation 3: Unmonitored worker potential exposure

- ◆ Page 10 of OTIB-0088 states:
  - “In general, it is expected that reconstructed dose to unmonitored workers will be less than dose to monitored workers.”
- ◆ This statement does not appear to be substantiated because it does not consider the fact that “unmonitored” workers also include workers whose records have been lost, destroyed, or are illegible.
- ◆ Some classes of workers had their radiation exposures controlled by their primary employer (e.g., subcontractor), who did not necessarily follow the same procedures as the prime contractors.

# Observation 4: Use of multiple badge records

- ◆ Page 13 of OTIB-0088 states:
  - “However, for cases in which multiple badges were issued for a particular monitoring period, only one zero measurement should be assigned per monitoring period.”
- ◆ While this policy may apply to multiple badges from the same facility worn during the same time period, there are instances where a worker may have worked at several facilities at a site and been issued different badges at each facility (e.g., Idaho National Laboratory). In those cases, all badge results should be analyzed.

## Observation 5: Clarification of application of NCRP-to-ICRP correction factors

- ◆ Attachment C provides the dates that DOE sites switched to using the ICRP 60 neutron weighting factors
- ◆ Need to include a statement that indicates that the NCRP-to-ICRP neutron correction factors need not be applied after the implementation of the ICRP 60 neutron weighting factors in the 2009–2011 timeframe
- ◆ Not all site profiles instruct the dose reconstructor to not apply the NCRP-to-ICRP correction factors after the implementation date

# Summary

- ◆ No findings
- ◆ Five observations to be addressed



# Questions?

# References

Advisory Board on Radiation and Worker Health. (2019). *Subcommittee for Procedure Review Wednesday, February 13, 2019* [Transcript of teleconference meeting]. <https://www.cdc.gov/niosh/ocas/pdfs/abrwh/2019/sctr021319-508.pdf>

International Commission on Radiological Protection. (1991). 1990 recommendations of the International Commission on Radiological Protection (Publication 60). *Ann. ICRP* 21(1-3).

National Institute for Occupational Safety and Health. (2006). *Occupational onsite ambient dose reconstruction for DOE sites* (ORAUT-PROC-0060, rev. 01). <https://www.cdc.gov/niosh/ocas/pdfs/arch/orau/orauprocs/or-proc-60-r1.pdf>

National Institute for Occupational Safety and Health. (2007). *External dose reconstruction implementation guideline* (OCAS-IG-001, rev. 3). SRDB Ref. ID 38864

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