



# Focused Review of ORAUT-OTIB-0066, Revision 01, for Resolution of Issues

Stephen L. Ostrow, PhD

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

November 3, 2021



# Purpose of focused review

- ◆ **Purpose:** Determine if ORAUT-OTIB-0066, revision 01, “Calculation of Dose from Intakes of Special Tritium Compounds,” addresses and resolves issues raised in SC&A’s 2008 review of revision 00.
- ◆ **Relevant documents:**
  - SCA-TR-TASK3-0010, rev. 0 (SC&A review of OTIB-0066, rev. 00), November 25, 2008
  - ORAUT-OTIB-0066, rev. 01, October 15, 2020
  - ORAUT-OTIB-0066, rev. 00, April 26, 2007

# Review methodology

- ◆ Compare rev. 00 and rev. 01 of OTIB-0066 to identify relevant changes and whether rev. 01 addresses SC&A's comments on rev. 00.
- ◆ Examine relevant entries in the Board Review System (BRS) pertaining to the OTIB.
- ◆ Review Subcommittee for Procedure Reviews (SCPR) meeting minutes for discussions pertaining to the OTIB.

# Issue addressed by the OTIB

“Stable metal tritides (SMTs) are a class of tritium compounds that cannot be detected by urine bioassay as easily as tritium oxide. . . . The material is more strongly retained in the lung, resulting in much smaller fractions of the intake excreted in urine. Therefore, a relatively small amount of tritium in a urine sample can indicate a large intake of an SMT.” (OTIB-0066, rev. 01, p.5)

# Purpose of the OTIB

“The purpose of this TIB is to provide guidance on how to use urine bioassay data to calculate best estimates of the annual organ doses for intakes of tritium in a metal matrix.” (OTIB-0066, rev. 01, p. 5)

# SC&A OTIB-0066, rev. 00, findings

- ◆ SC&A's 2008 evaluation of revision 00 had four findings.
- ◆ After discussions at the March 24, 2009, SCPR meeting, findings 1 and 3 were placed in abeyance and findings 2 and 4 were closed.
- ◆ This review of revision 01 discusses the two findings, 1 and 3, that are in abeyance.

# Finding 1 statement (issue 3) from SC&A's 2008 review

“The recommendation given in ORAUT-OTIB-0066 to assess dose due to intake of OBT [organically bound tritium] is not claimant favorable. The OTIB recommends the use of the methodology given in ORAUT-OTIB-0011 . . . to calculate doses from intakes of OBT to all organs and tissues. The dose coefficient for OBT given in ICRP Publication 78 . . . , which is  $1.52 \times 10^{-7}$  mrem/pCi . . . ; the one derived applying the biokinetic model for OBT . . . using the AIDE computer code, which is  $1.52 \times 10^{-7}$  mrem/pCi . . . ; and the one derived using the methodology given in ORAUT-OTIB-0066 . . . , which is also  $1.52 \times 10^{-7}$  mrem/pCi . . . , are 1.4 times higher than the one obtained applying the methodology given in ORAUT-OTIB-0011 . . . , which is  $1.08 \times 10^{-7}$  mrem/pCi.” (p. 16)

# Finding 1 resolution

- ◆ **BRS:** The most recent NIOSH BRS entry (Oct. 21, 2020) states: “The recommendation to use the methodology given in ORAUT-OTIB-0011 to calculate doses from intakes of OBT to all organs and tissues has been removed in Rev. 01 of this document. It now specifies that IMBA must be used for such an assessment.”
- ◆ **OTIB-0066, rev. 01:** Recommendation 3: “Because the ORAUT-OTIB-0011 . . . method underestimates the dose from an OBT intake by about 30%, it cannot be used for assessment of OBT. IMBA must be used for intake assessments when based on urine bioassay and IMBA or Web CAD used for dose assessment.” (p. 10)

## Finding 3 statement (issue 5) from SC&A's 2008 review

“OTIB-0066 does not ensure that resultant doses are based on adequate monitoring data. . . .

The method of choice for personnel monitoring is particulate air monitoring: however, there are multiple issues with the use of these data.” (p. 18)

# Finding 3 resolution: BRS

- ◆ NIOSH BRS entry January 23, 2009, states:

“NIOSH agrees that air monitoring data are useful for evaluating intakes of stable metal tritides . . . . However, in the absence of such data, urine bioassay can be used to bound the SMT intake and subsequent dose to the respiratory tract and systemic organs.

A discussion of the practical interpretation of urinalysis results following an intake of SMT and the technical shortfalls associated with using urine bioassay data might be useful to the dose reconstructors and therefore will be added to ORAUT-OTIB-0066.”

# Finding 3 resolution: OTIB-0066, revision 01

- ◆ Section 2.0, “Purpose,” of revision 01 is a substantial expansion of the brief original section in revision 00.
- ◆ The expanded section adequately addresses SC&A’s concerns about discussing the issues involved in SMTs and provides dose reconstructors with guidance on assigning doses to organs exposed to SMTs.

# Conclusion

- ◆ **Conclusion:** Based on a focused review of OTIB-0066, revision 01, SC&A concludes that findings 1 and 3 have been adequately addressed and resolved.
- ◆ **Recommendation:** SC&A recommends closure of findings 1 and 3.



# Questions?