

Office of Compensation Analysis and Support
Program Evaluation Report

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Revision No. 0

**Evaluation of the Impact of Changes to the Isotopic Ratios in for the
Paducah Gaseous Diffusion Plant**

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Supersedes: None

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RECORD OF ISSUE/REVISIONS

ISSUE AUTHORIZATION DATE	EFFECTIVE DATE	REV. NO.	DESCRIPTION
8/13/2007	8/13/2007	0	This document provides a list of previously completed claims that are potentially affected by a revision to the Paducah isotopic ratios.

1.0 Description

On October 25, 2006, Revision 01 of ORAUT-TKBS-0019-5¹, Occupational Internal Dose, was issued as part of the biennial review process. During the biennial revision of this TBD section, the information provided in the existing document was evaluated to ensure that the published isotopic ratios for transuranic (TRU) radionuclides met the criteria of providing either an accurate or a bounding dose estimate. The results of the evaluation indicated that the current ratios did **not** meet that goal. Information found in existing references (particularly PACE and the University of Utah, 2000²; BJC, 2000³), as well as that found in a new reference⁴, was evaluated against the ratios in the existing site profile section. Based on this evaluation, new TRU isotopic ratios were developed and are included in the TBD as Tables 5-2 and 5-2a in the revised document.

On November 7, 2006 Revision 01 of ORAUT-TKBS-0019-4⁵, Occupational Environmental Dose was issued. A reevaluation of the source data for ORAUT-TKBS-0019-5 led to a revision to the TRU isotopic ratios (relative to uranium) for estimating dose from these radionuclides. In addition, the authors have been able to categorize these ratios according to specific processes and periods as described below in conjunction with ORAUT-TKBS-0019-5.

On January 11, 2007 and April 4, 2007 page changes 1 and 2 respectively of ORAUT-TKBS-0019-5 were issued. These changes corrected typographical errors and omissions in revision 1 but did not affect any dose assignments. On April 23, 2007 a similar type of page change was issued for ORAUT-0019-4.

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2.0 Issue Evaluation

The new isotopic ratios will provide a bounding, yet plausible estimate of internal dose due to TRU radionuclides present in recycled uranium. The new data is categorized according to specific plant areas shown below for both pre-1983 and post-1983 operations:

Pulverizer, Ash Handling, Green Salt Production
Converter Salvage Line
⁹⁹Tc/²³⁷Np Recovery
Balance of Plant (cascade operations/maintenance, etc)

In addition, ratios for ²⁴¹Am and plutonium isotopes (²³⁸Pu, ²⁴⁰Pu, ²⁴²Pu, and ²⁴¹Pu) were added. These changes will have the effect of increasing the dose estimates for claimants who worked in these operations from 1953 through the end of enrichment operations, with the exception of Balance of Plant Operations which will have lower dose estimates.

3.0 Plan for Resolution or Corrective Action

An initial selection of claims was based on the following search criteria:

1. Probability of Causation (POC) less than 50%
2. Dose Reconstructions completed prior to November 7, 2006.

These criteria were used to produce a list of 734 potentially affected claims. NIOSH will provide this list to DOL and request these claims be returned for a new dose reconstruction. The new dose reconstruction will be completed using all the current methodology which will account for any other changes affecting these claims.

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4.0 References

1. ORAUT (Oak Ridge Associated Universities Team), ORAUT-TKBS-0019-5, *Technical Basis Document for the Paducah Gaseous Diffusion Plant – Occupational Internal Dose, Rev 02*, April 4, 2007.
2. PACE (Paper, Allied Industrial, Chemical and Energy Workers International Union) and University of Utah, *Exposure Assessment Project at the Paducah Gaseous Diffusion Plant*, December 2000.
3. BJC (Bechtel Jacobs Company) *Recycled Uranium Mass Balance Project Paducah Gaseous Diffusion Plant Site Report, BJC/PGDP-167*, March 5, 2000.
4. Hightower, J.R., L.R. Dole, D.W. Lee, G.E. Michaels, M.I. Morris, D.G. O’Conner, S.J. Pawel, R.A. Schmoyer, L.D. Trowbridge, and V.S. White, *Strategy for Characterizing Transuranics and Technetium contamination in Depleted UF₆ Chlinders*, ORNL/TM-2000/242, UT-Battelle, Oak Ridge National Laboratory, October 2000.
5. ORAUT (Oak Ridge Associated Universities Team), ORAUT-TKBS-0019-4, *Technical Basis Document for the Paducah Gaseous Diffusion Plant – Occupational Environmental Dose, Rev 02*, April 23, 2007.