



# A Review of NIOSH's Program Evaluation Report DCAS-PER-034, "Harshaw Chemical Company TBD Revision"

Ron Buchanan, PhD, CHP, SC&A, Inc.

Advisory Board on Radiation and Worker Health,  
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# Harshaw Chemical Company operations

- ◆ The Harshaw chemical plant was located in Cleveland, Ohio
- ◆ Harshaw received feed material from various uranium mills throughout the United States and Canada and produced uranium compounds under U.S. Government contract from 1942 through 1955
- ◆ Plant processes outlined in ORAUT-TKBS-0022, rev. 01, section 2.2 of SC&A's review
- ◆ Source terms:
  - Uranium tetrachloride
  - Uranium hexafluoride
  - Uranium tetrafluoride
  - Uranium trioxide
  - Uranium dioxide
  - Uranyl nitrate hexahydrate
  - Operations involving other radiological materials in limited quantities included uranium oxyfluoride, sodium uranate, uranium nitrate, and low-enriched uranium

# Harshaw Chemical Company documents

- ◆ **February 1, 2007:** SEC-00066 established for the period August 14, 1942, through November 30, 1949, because of deficiencies in bioassay monitoring prior to December 1949
- ◆ **August 17, 2007:** NIOSH issued Harshaw technical basis document (TBD) ORAUT-TKBS-0022, rev. 00
- ◆ **May 30, 2008:** SC&A issued review of ORAUT-TKBS-0022, rev. 00, with six findings
- ◆ **June 2, 2009:** NIOSH issued Harshaw TBD ORAUT-TKBS-0022, rev. 01
- ◆ **August 26, 2024:** SC&A issued review of Harshaw TBD ORAUT-TKBS-0022, rev. 01, with no findings or observations

# Harshaw DCAS-PER-034

- ◆ **December 9, 2011:** DCAS-PER-034 issued to address changes in table 5-6 of ORAUT-TKBS-0022, rev. 01, concerning type S uranium intake values, as outlined in SC&A's finding 6 of ORAUT-TKBS-0022, rev. 00

# Internal monitoring by bioassay

- ◆ **August 14, 1942, through November 30, 1949:** NIOSH determined it is not feasible to assess internal dose due to lack of internal dosimetry data for uranium radionuclides at Harshaw (SEC-00066)
- ◆ **Beginning December 1, 1949:** NIOSH finds there is adequate information available to perform internal DR; however:
  - There did not appear to be a routine bioassay program that included all potentially exposed workers at all times
  - Bioassay monitoring was instituted for certain locations or operations, but not on a continuous basis
  - Therefore, use coexposure data for unmonitored workers
- ◆ **1953:** Urinalysis data appeared to end

# Air sampling

- ◆ There are no known radon measurements taken during Harshaw operations
- ◆ Airborne radioactive dust samples for uranium were taken periodically at Harshaw starting in approximately 1943
- ◆ First formal program of airborne radioactive dust measurements at Harshaw was around 1948

# External monitoring

- ◆ Beta and gamma doses to extremities were potentially high for workers handling uranium hexafluoride ash and other residues
- ◆ Film badging at Harshaw began on at least an intermittent basis in August 1944
- ◆ Although some improvements were instituted, film badging did not appear to become routine until 1947, correlated with significant production increases

# SC&A's 2008 review of TBD, revision 00

- ◆ Reviewed ORAUT-TKBS-0022, rev. 00, in May 2008
- ◆ Identified six findings and no observations
- ◆ Findings 1 through 5 pertained to NIOSH recommendations for internal and external DR and were addressed by Subcommittee for Procedures Review (SPR) and closed in 2013
- ◆ Finding 6 was concerned with intake rates for type S uranium

# SC&A's finding 6 – Intake rates for type S uranium

- ◆ Type S uranium intake rates too low in tables 5-6 and A-7 of ORAUT-TKBS-0022, rev. 00
- ◆ ORAUT-TKBS-0022, rev. 01, revised intake rates for type S uranium
- ◆ NIOSH issued DCAS-PER-034 to address changes in rev. 01 of TBD

# SC&A's subtask 1 review of DCAS-PER-034

- ◆ **Subtask 1:** Identify circumstances that necessitated DCAS-PER-034:
  - SC&A reviewed ORAUT-TKBS-0022, rev. 00 and 01, and PER-034
  - DCAS-PER-034 addressed changes in rev. 01 of TBD that could potentially result in increased internal dose assignments
  - Additional changes in rev. 01 were for other purposes and did not result in a potential increase in assigned dose
  - No findings or observations pertaining to subtask 1

# SC&A's subtask 2 review of DCAS-PER-034

- ◆ **Subtask 2:** Assess NIOSH's specific methods for corrective action:
  - Reviewed rev. 01 of TBD and compared text, figures, and tables in it to rev. 00 of 2007
  - Increases in type S uranium intake rates were correctly captured in PER-034
  - No findings or observations pertaining to subtask 2

# SC&A's subtask 3 review of DCAS-PER-034

- ◆ **Subtask 3:** Evaluate PER's stated approach for identifying number of DRs requiring reevaluation of dose mandated by DCAS-PER-034
- ◆ NIOSH used the following criteria to identify previously completed claims requiring reevaluation:
  - Probability of causation (POC) less than 50 percent
  - Most recent version of DR approved by DCAS on or prior to June 2, 2009 (date of Harshaw rev. 01 TBD)
  - Employment at Harshaw between December 1, 1949, and December 31, 1953
- ◆ These criteria were used to generate a list of six potentially affected claims

## Subtask 3: NIOSH's processing of the 6 claims

- ◆ Removed one claim because intake was originally calculated using EE's bioassay data. Rev. 01 of TBD indicates these data should still be used, if available; therefore, no change would occur in assigned dose
- ◆ Recalculated dose and resulting POC for five remaining claims using rev. 01 of ORAUT-TKBS-0022
  - New POC was less than 50 percent for each of the five reworked claims
  - Did not request that U. S. Department of Labor return any of previously completed claims based on rev. 01 of TBD

# SC&A's evaluation of NIOSH's search method

- ◆ Evaluated NIOSH's method of identifying previously completed claims used to create a list of potential cases for review:
  - SC&A does not have access to database used by NIOSH to identify and quantify those cases that qualified for reevaluation
  - DCAS-PER-034 did not provide total number of cases that met NIOSH's query, or number of cases removed
  - SC&A concluded that search terms were appropriate and all-inclusive
  - No findings or observations pertaining to subtask 3

# SC&A's recommendation for DCAS-PER-034 subtask 4 case review

- ◆ **Subtask 4:** Conduct audits of a sample set of reevaluated DRs mandated by DCAS-PER-034
- ◆ SC&A suggests that one of the five reworked DRs be selected for review where worker was assigned type S uranium intake from table 5-6 of ORAUT-TKBS-0022, rev. 01

# Summary of SC&A's evaluation of DCAS-PER-034

- ◆ SC&A reviewed DCAS-PER-034 and identified no findings or observations

# Summary of SC&A's evaluation of site profile

- ◆ SC&A reviewed rev. 01 of ORAUT-TKBS-0022 and identified no findings or observations



# Questions?