



Review of NIOSH's Program Evaluation Report DCAS-PER-036, "Blockson TBD Revision"

Kathleen Behling, SC&A, Inc.

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

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Blockson Chemical Company (BCC) documents

- ◆ **September 11, 2006:** NIOSH issued technical basis document (TBD) OCAS-TKBS-0002, rev. 0, “Technical Basis Document for Atomic Energy Operations at Blockson Chemical Company, Joliet, Illinois”
- ◆ **June 20, 2007:** OCAS-TKBS-0002, rev. 01, issued, which expanded site descriptions, included new radiological data, and added several radionuclides
- ◆ **July 31, 2007:** OCAS-PER-020, rev. 0, issued to evaluate the impact of issuing rev. 01 of OCAS-TKBS-0002
- ◆ **November 21, 2007:** OCAS-TKBS-0002, rev. 02, of the BCC TBD issued
- ◆ **December 20, 2010:** DCAS-TKBS-0002, rev. 03, of TBD was issued

DCAS-PER-036

- ◆ **April 5, 2012:** Issued to address the impacts of changes introduced between TBDs revision 02 and revision 03 on previously adjudicated BCC claims

BCC operations

- ◆ BCC is an Atomic Weapons Employer facility in Joliet, Illinois, that manufactured wet-process phosphoric acid, which was used to manufacture other chemicals
 - ◆ Received phosphate ore concentrates from Florida mining operations
 - ◆ Operations processed about 6,000 net tons of phosphate rock per week, and produced about 50,000 pounds of dry powder uranium oxide per year
 - ◆ Operational period: 1951–June 1960
 - ◆ Residual period ended in October 2009
- ◆ Source terms:
 - uranium (U)-238
 - U-234
 - U-235
 - thorium (Th)-230
 - radium-226
 - radon (Rn-222)
 - background concentrations of Th-232



BCC monitoring

- ◆ Bioassay records available for uranium from 1954 through 1958
- ◆ No indication that external dosimetry was provided
- ◆ Special Exposure Cohort (SEC) issued because exposure to radon cannot be reconstructed from March 1, 1951, through June 30, 1960

SC&A's review of BCC documents

- ◆ **March 23, 2009:** SC&A issued its Subtasks 1–3 review of PER-020, which identified three findings associated with review of OCAS-TKBS-0002, rev. 01
- ◆ **October 15, 2013:** SC&A issued its Subtask 4 review of PER-020, which identified three findings
- ◆ **September 11, 2024:** SC&A issued its review of [PER-036 Subtasks 1–3](#)

Subtask 1: Changes necessitating PER

- ◆ **DCAS-TKBS-0002, revision 03:** Changes that may increase dose:
 - Radon exposure increased from 1963 to end of residual contamination period
 - Particulate intakes increased during the residual period after 1977
- ◆ **SC&A's Subtask 1 review:** No findings or observations

Subtask 2: Assess corrective action methods

- ◆ SC&A's Subtask 2 evaluation was performed under our review of PER-020, which included reviewing revisions 01, 02, and 04 of the BCC TBD
- ◆ SC&A's three PER-020 Subtasks 1–3 findings associated with review of TBD rev. 01:
 - Building 55 worker may have been exposed to type S uranium compounds
 - If ingested, a lower solubility uranium material would imply a lower f1 value
 - Estimates of indoor radon concentrations used inappropriate surrogate data resulting in low exposure values
- ◆ SC&A's three PER-020 Subtask 4 findings:
 - Internal dose calculation inconsistent with OCAS-TKBS-0002, rev. 02, guidance
 - Calculation of inhalation dose not consistent with OCAS-TKBS-0002, rev. 02, guidance
 - Identification of a potential error in the Blockson Building 55 inhalation tool
- ◆ All findings closed with issuance of TBD rev. 04, establishment of SEC, and an update to Building 55 inhalation tool
- ◆ SC&A had no findings or observations for PER-036 Subtask 2 review

Subtask 3: Potentially affected claims

- ◆ NIOSH identified two separate populations of potentially affected claims, since dose increased for two exposure pathways:
 - Population 1: Increase in radon exposure
 - Population 2: Changes in particulate intake

Subtask 3: PER selection criteria for determining DRs requiring a rework

Population 1 selection criteria

- ◆ POC less than 50%
- ◆ DR was approved on or prior to December 20, 2010 (issue date of TBD rev. 03)
- ◆ Employment at BCC after 1962 (residual period dates impacted)
- ◆ Verified cancer of a respiratory tract organ

Population 2 selection criteria

- ◆ POC less than 50%
- ◆ DR was approved on or prior to December 20, 2010 (issue date of TBD rev. 03)
- ◆ Employment at BCC after 1977 (years where particulate intakes increased)

NIOSH identification of potential number of DRs requiring a rework

Population 1

- ◆ Four claims identified
- ◆ Three included in SEC and had no additional non-presumptive cancer
- ◆ One reworked case resulted in POC <50%

Population 2

- ◆ To establish employment periods where TBD rev. 03 would result in a higher intake, NIOSH compared integrated intake rates for both versions of the TBD from varying start dates:
 - Energy employees (EEs) with employment starting after 1974 and continuing to the end of the residual period would have higher intake under TBD rev. 03
- ◆ 32 claims identified with employment after 1977
 - All claims had employment start dates prior to 1975 and were eliminated

SC&A's Subtask 3 assessment

- ◆ SC&A does not have access to NIOSH DCAS Claims Tracking System to review the data used to identify and quantify those cases that qualify for reevaluation but considers screening criteria to be scientifically sound
- ◆ Using inhalation and ingestion intakes in TBD rev. 02 and 03, SC&A independently compared integrated intake rates for various years:
 - Confirms that EEs with employment dates prior to 1975 would have lower total particulate intakes derived from TBD rev. 03 than those calculated with rev. 02
 - Concurs with NIOSH's evaluation of impact on the Population 2 claims and agrees that no case reworks were necessary
- ◆ SC&A has no findings or observations for Subtask 3

Subtask 4: Audit of reevaluated DRs

- ◆ SC&A recommends that the single reworked case associated with the increase in radon dose during the residual contamination period (Population 1) be reviewed



Questions?