

Simonds Saw and Steel Residual Contamination Period

Thomas P. Tomes
NIOSH
Division of Compensation Analysis and Support

July 29, 2014
Idaho Falls, Idaho

Site description

- Lockport, New York
- Atomic Weapons Employer (AWE) 1948 – 1957
- Residual Radiation period 1958 – March 1, 2011
- Rolled uranium (U) billets into rods for the Atomic Energy Commission (AEC) and hammered, forged, and rolled thorium (Th) metal

AWE Operations

- Utilized 16-inch and 10-inch rolling mills and hammer forge
- Some U monitoring data, but sparse information on Th work and exposures
- Some area cleanup before AEC contract ended

Residual Period

- Fixed contamination and contaminated soil remained (primarily U)
- Continued to operate as a steel plant until 1983 bankruptcy
- Extensive characterizations for radiation and contamination

Special Exposure Cohort Petition

- NIOSH received petition on December 4, 2009
- Petitioner-requested Special Exposure Cohort (SEC) class

All employees who worked in any area at Simonds Saw and Steel, Lockport, New York, during the applicable covered operational and residual periods from 1948 through 2006

- Petition qualified for evaluation March 8, 2010 based on lack of Th monitoring data

Evaluation Report

- NIOSH issued the report on October 29, 2010
- Recommended class of All AWE employees who worked at Simonds Saw and Steel from January 1, 1948, through December 31, 1957
- NIOSH found that doses could be reconstructed during the residual period

Board Actions

- On November 16, 2010 , NIOSH presented the report to the Advisory Board on Radiation and Worker Health (the Board) in Santa Fe, New Mexico
- Added SEC class from 1948 through 1957 (HHS designation effective February 5, 2011)
- Postponed the residual contamination period discussion until after site profile reviews

Site Profile Review

- In June 2012, SC&A submitted its review of the site profile (ORAUT-TKBS-0032 Revision 1) to the Board
- SC&A reported 7 Findings for additional evaluation/discussion
- Provided additional observations on the site profile

SC&A's Site Profile Findings

■ Findings 1 through 5

- Comments on various details of the external and internal dose models during the AWE operational period (the SEC period)
- Discussed by the TBD-6000 Work Group, NIOSH, and SC&A and set aside pending a Site Profile revision

■ Findings 6 and 7

- Focused on the external and internal doses, respectively, during the residual contamination period

Findings 6 and 7

- **Finding 6:**

More Quantitative and Substantive Discussion of Available External Monitoring During the Residual Period

- **Finding 7:**

Appropriateness of Chosen Internal Methodology during Residual Period and Consistency with OTIB-0070

Residual Period Radiation Exposures

- **Internal Dose: Inhalation and ingestion of U and Th from residual contamination**
- **External dose: Photon and beta exposure from residual U and Th contamination**
- **Analytical data indicates contamination is >99% U**

SC&A Finding 6 Issues

- More discussion of available radiation survey data during the residual period
- Values used to determine the gamma dose rate distribution
- Beta dose rates at the 10-inch-bar mill
- Number of work hours used to calculate annual doses

Responses to Finding 6

- Dose rate surveys were performed in 1957 after clean up and prior to AEC contract ended
- Characterization surveys were performed in 1976 and 1980 while the plant was still operating
- After plant closure in 1983, characterization surveys were performed in 1984, 1999, and 2007

Responses to Finding 6 (cont.)

NIOSH recommended changes to the Site Profile

- Gamma dose rate of 0.08 mR/hour for 2,500 hours per year to be applied as a constant
- Beta dose rate of 1.35 mrad/hour for 2,500 hours per year to be applied as a constant
- Assumptions are presumed to provide a bounding annual dose to operators of the rolling mill after AEC contract work ended

SC&A Finding 7 Issues

- Air concentration at the beginning of the residual contamination period
- Explain how Exposure Point Concentrations were developed from the 2007 survey data
- Provide additional justification for presuming source term depletion ended in 1982
- The number of work hours used to calculate intake rates

Responses to Finding 7

Air concentration at the start of residual period:

- Reviewed available data
- Evaluated general area air concentrations measured during U rolling operations in 1954
- Proposed a revised value to use for the estimate of air concentration at the beginning of the residual period

Responses to Finding 7 (Cont.)

The 2007 Exposure Point Concentrations (EPC) were:

- Taken from the U.S. Army Corps of Engineers (USACE) Remedial Investigation Report
- Surface contamination data and calculation methods and results summarized in the Remedial Investigation Report
- EPC was reported for each building based on thousands of measurements of surface contamination data from 2007
- EPC was the 95% upper confidence limit

Responses to Finding 7 (Cont.)

NIOSH made additional data requests to the USACE, and received:

- Copies of survey reports and maps
- Survey reports in spreadsheet format
- Spreadsheets used to analyze data
- Other analytical data from the remedial investigation

Responses to Finding 7 (Cont.)

NIOSH evaluated the 2007 contamination data:

- **Determined a favorable value for the mostly highly contaminated areas, eliminating hundreds of survey points of remote areas of the plants and exterior surface**
- **NIOSH also evaluated contamination data from previous characterization in 1999**
- **Recommended a revised upper 95% confidence limit value based on the building with the highest surface contamination**

Responses to Finding 7 (Cont.)

Source term depletion response:

- The re-evaluated data is inconclusive on whether source depletion continued or ended when rolling mill closed
- Building 24 is an active work area (not isolated), part of it has contaminated overhead beams
- NIOSH now recommends assuming depletion throughout the residual period by depleting the initial air concentration estimates at a rate to agree with the 2007 air concentration estimates

Summary

- **Revise the Site Profile to address findings and comments in the Review**
- **Proposed changes to the Site Profile were discussed with SC&A and the TBD-6000 Work Group**
- **Changes are being made for:**
 - **partial dose reconstructions for the AWE operational period and for full dose reconstructions for the residual period**

Dose Reconstruction Feasibility

- NIOSH found the available data are insufficient to estimate dose from thorium for the AWE Contract Period, SEC from 1948 – 1957
- NIOSH determined all doses can be reconstructed for the Residual Contamination Period, 1958 – March 2011