



Issues Resolution Roadmap for Metals and Controls Corporation

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To the Advisory Board on Radiation and
Worker Health's Work Group on Metals and
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Goals of Roadmap

- ◆ Summarize main exposure pathways
- ◆ Attempt to group findings, observations, concerns, and issues into exposure scenarios
- ◆ Summarize status of all findings, observations, concerns, and issues
- ◆ Make recommendations on paths forward

Exposures Scenarios

Building 10 Exposures

- Subsurface and Pipes
- HVAC Maintenance
- Roof and Overhead
- Welding

Non-Building 10 Exposure Scenarios

- Below Ground Outdoor
- Above Ground Outdoor
- Waste Water

Overarching Issues

- External
- Substitute Data
- Thorium

Building 10 subsurface and pipes

Comparison of Building 10 subsurface and pipes model parameters

Parameter	SC&A	NIOSH
Contamination level	95th percentile (ordered data calculated 5,878.1 pCi/g)	95th percentile (lognormal calculated 6,887.84 pCi/g)
Dust loading	200 $\mu\text{g}/\text{m}^3$	220 $\mu\text{g}/\text{m}^3$
Breathing rate	2.5 m^3/hr	1.2 m^3/hr
Exposure duration	2 months	2 months
U inhalation rate	40 Bq/yr	Not provided

- ◆ Although there are differences in assumptions, SC&A believes that both sets of assumptions are scientifically sound and claimant favorable
- ◆ SC&A recommendation: Close

Building 10 HVAC maintenance

Comparison of Building 10 HVAC maintenance model parameters

Parameter	SC&A	NIOSH
Specific activity (gross alpha)	1.23E-4 dpm/ μ g	1.23E-4 dpm/ μ g
Dust loading	100 mg/m ³	100 mg/m ³
Breathing rate	1.2 m ³ /m ³	1.2 m ³ /m ³
Dose rate	1.77 mrem/hr	1.7 mrem/hr

- ◆ In the NIOSH white paper dated October 24, 2018, NIOSH fully accepted SC&A's assessment and conclusions regarding the internal exposures HVAC exposure scenario
- ◆ SC&A recommendation: Close

Building 10 roof and overhead

Comparison of Building 10 roof and overhead model parameters

Parameter	SC&A	NIOSH
Removable surface contamination (gross alpha)	11.7 dpm/100 cm ²	8.99 dpm/100 cm ²
Resuspension factor	100 1E-4/m	100 1E-4/m

- ◆ Differences in how zeros are treated account for the majority of the difference in tabulated values
- ◆ SC&A found that the NIOSH approach was scientifically sound and claimant favorable
- ◆ SC&A recommendation: Close

Building 10 welding work

- ◆ SC&A is currently drafting a response regarding thorium and welding
- ◆ SC&A recommendation: Remain In Progress

Outdoor above ground external exposures

- ◆ SC&A calculated annual effective dose of 5.32 mrem
- ◆ Lower than monthly dose derived by NIOSH via dosimetry
- ◆ SC&A recommendation: Close

Outdoor below ground external exposures

- ◆ SC&A calculated an annual effective dose of 2.08 mrem (assuming 200 hr/yr occupancy)
- ◆ Lower than monthly dose derived by NIOSH via dosimetry
- ◆ SC&A recommendation: Close

Waste water treatment exposures

- ◆ SC&A evaluated scenario raised by worker interview
- ◆ Doses were found to be negligible
- ◆ SC&A recommendation: Close

External exposures

- ◆ NIOSH retooled their approach in the September 12, 2018, M&C SEC issues matrix
 - beta skin dose of 12 mrem/ month
 - penetrating dose of 4 mrem/ month

- ◆ SC&A calculates:

Column	Standing on contaminated slab	Subsurface environment in Building 10	HVAC maintenance
Beta skin dose	<1 mrem/month	32.5 mrem/month	<1 mrem/month
Penetrating dose	<1 mrem/month	12.75 mrem/month	<1 mrem/month

- ◆ SC&A has remaining concerns about the applicability of the 1967 data to the residual period; however, SC&A finds the NIOSH calculation to be bounding

Substitute data

- ◆ Many concerns have been raised regarding the applicability of survey data from the 1980s and 1990s to represent earlier parts of the residual period.
- ◆ The NRC concluded no significant differences were observed between the data collected at the termination of AWE operations and the data collected in the NRC 1983 surveys.
- ◆ The NRC made a similar statement that the 1983 data compare well with the data collected in the 1990s.

Thorium exposures

- ◆ SC&A is currently drafting a response regarding thorium and welding
- ◆ SC&A recommendation: Remain In Progress



Questions?