Current Status of W. R. Grace TBD Finding 4

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To the Advisory Board on Radiation and Worker Health

Uranium Refining AWE Work Group

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Finding 4: Lack of neutron dose assignment

- SC&A reviewed ORAUT-TKBS-0043 in 2013.
- SC&A questioned the lack of neutron dose assignment.
- SC&A did not locate any recorded neutron doses in the claimants' files reviewed.
- Further investigation of the potential neutron exposure and methods to assign appropriate neutron dose was needed.

Finding 4: Response to SC&A's concern

- NIOSH agreed that further investigation was necessary.
- The finding was discussed during the Work Group on Uranium Refining Atomic Weapons Employers teleconference on August 3, 2015.
- SC&A agreed that the proposed approach was reasonable and would evaluate the data and recommended methods when available.

Finding 4: NIOSH issued white paper May 1, 2017

- NIOSH issued “Neutron Dose Assignment for Plutonium Fuel at W.R. Grace.”
- In the white paper, NIOSH analyzed the neutron-to-photon (N:P) ratios at other U.S. Department of Energy (DOE) sites that processed plutonium in a similar manner and of similar composition as at W. R. Grace.

Finding 4: SC&A's evaluation of NIOSH's white paper

- SC&A evaluated NIOSH's white paper and issued a memorandum September 26, 2017.
- SC&A reviewed N:P ratios used at other DOE sites that processed plutonium and found them to range from 0.21 to 1.1 for non-glovebox workers, and to range from 1.0 to 1.7 for glovebox workers.
- SC&A had reviewed revision 03 to the Nuclear Materials Equipment Corporation (NUMEC) site profile in 2017 and concurred with NIOSH's recommended N:P ratio GM value of 0.34 for non-glovebox workers and N:P ratio GM value of 1.00 for glovebox workers at NUMEC.

Finding 4: SC&A has remaining concerns

- SC&A did not find that NIOSH's recommendations for the determination of potential neutron exposure (as provided in the last paragraph on page 6 of NIOSH's 2017 white paper) to be applicable or adequate for W. R. Grace because:
  - There was no significant neutron monitoring before, during, or after the processing of plutonium at W. R. Grace.
  - Detailed photon dosimetry calibration information is not available for W. R. Grace.
  - Although the plutonium fuel was similar in composition, the facility layout and scale of operation were different at W. R. Grace from those at other sites. Therefore, information from the other sites is not very useful for application at W. R. Grace.

Conclusions

- Unless there are consistent DOE records for W. R. Grace workers indicating that they have worked, or not worked, with plutonium, it may be necessary to assign neutron dose to each production worker in Buildings 234 and 110 during the plutonium production era (1965–1972), unless the worker's record indicates otherwise.
- Additionally, potential for neutron exposure from plutonium needs to be addressed during the standby (storage) phase (1973–1987) and during the decontamination phase (1987–1994) for workers involved in those operations.
- Neutron exposures from uranium (as discussed in ORAUT-TKBS-0043, revision 02, page 28) were not included in NIOSH's white paper and have yet to be addressed.

Questions?