



## MEMO

**DATE:** July 2, 2015  
**TO:** KCP Work Group  
**FROM:** Joe Fitzgerald, SC&A  
**SUBJECT:** Status of KCP Outstanding Issues

---

With the Kansas City Plant (KCP) Work Group (WG) meeting scheduled for July 16–17, 2015, SC&A believes it is useful to recap our understanding of the status of outstanding Special Exposure Cohort (SEC) issues, along with issue-specific comments that may serve to facilitate discussion at the WG meeting.

To date, the following issue dispositions have taken place or are still pending:<sup>1</sup>

### **Issue 1: Data Completeness, Legibility, and Accuracy**

In a June 11, 2015, memorandum to the WG, NIOSH provided its approach for validating the existing internal and external dose electronic database by comparison with raw records. It was noted that “NIOSH plans to extract data from DOE-supplied dose records in the 691 NOCTS claims currently available” and “compare this raw data to that in the database previously used for the coworker model.”

**SC&A Status/Comments:** Assuming that the “DOE-supplied dose records” provided as part of the NIOSH/OCAS Claims Tracking System (NOCTS) contain the original source or raw records for both external and internal doses, SC&A believes this would be an appropriate means by which the electronic database can be validated through comparison sampling. (It would be useful for NIOSH to identify to the WG what degree of sampling it intends to do).

### **Issue 7: Radioactive Waste**

In an April 14, 2015, memorandum to the WG, SC&A concluded that these activities were being performed by a worker category (laborers) distinct from uranium or thorium workers who, based on interviews with affected workers, were not routinely badged or bioassayed.

In a subsequent review of the KCP database, NIOSH found that 2 of the 4 identified laborers (from a larger population) who handled radwaste had bioassays in their records. NIOSH indicated in its June 11 memorandum that it will use these data “where available” to reconstruct doses. It is noted that, “NIOSH has reviewed safety procedures that span the years 1951–1975,” and that radiological control measures evinced in those procedures provide “supporting evidence that the methods in the ER plausibly bound exposures during this period.” NIOSH further reviews SC&A’s 2007 report, *A Focused Review of Operations and Thorium Exposures of the*

---

<sup>1</sup> Note that this represents SC&A’s summary of the issue and its disposition; for specific wording, see the cited NIOSH documents.

*Dow Chemical Madison Plant*, and concludes that it is “not likely that KCP waste handlers were exposed to a higher concentration [of airborne Th-232] on a 2,000-hour time-weighted-average (TWA) basis.”

**SC&A Status/Comments:** What NIOSH does not indicate is how these data compare with that of KCP uranium workers, and whether it would be claimant favorable to assign the uranium worker data distribution, given that there are only two data points for this worker category (i.e., laborers who handled radwaste). With such a small dataset, it is not clear that enough data exist for a coworker dose distribution for radwaste handlers. The same question would apply for the radwaste handlers for Mg-Th wastes.

### **Issues 11/12: Neutron Dose**

NIOSH notes that SC&A’s April 21, 2015, memorandum to the WG concluded that “NIOSH’s use of a neutron dose of 0.154 rem/year for KCP workers that may have been exposed to neutrons is reasonable and claimant favorable,” and further notes that “SC&A considers the present KCP SEC neutron dose-related issues addressed and the issues have been closed by the Advisory Board.”

**SC&A Status/Comments:** SC&A concurs with NIOSH’s statement, and recommends final WG closure.

### **Issue 13: Mg-Th**

SC&A issued its white paper response on May 12, 2015, and is awaiting a NIOSH response. A teleconference was held between NIOSH, two Advisory Board members, and SC&A on June 29, 2015, to clarify how best to approach performing sample dose reconstructions to validate previously proposed NIOSH approaches for reconstructing Mg-Th exposures at KCP. For Mg-Th, one scenario discussed is to dose reconstruct a hypothetical worker who machined Mg-Th from 1963–1979, which encompasses the time periods and locations in question.

### **Issue 15: Thorium Oxide Operations**

NIOSH notes that SC&A (in its April memorandum) recommends closure and NIOSH agrees.

**SC&A Status/Comments:** Closure recommended.

### **Issue 17: D&D Activities**

Similar to Issue 7 for radwaste handlers, SC&A concluded that these activities were being performed by a worker category distinct from uranium or thorium workers, who were not necessarily monitored (based on interviews), and that these workers (laborers) would have been potentially exposed. Again, NIOSH notes that it had identified 2 out of 4 laborers as having internal monitoring records and “will use that data where appropriate to reconstruct doses.” It is further noted that the ER acknowledges and addresses the fact that various worker categories had “varying exposure potential,” and that furthermore, an extensive procedural review confirmed

that KCP implemented a “robust area and personal monitoring program.” Similarly, a review of SC&A’s 2007 report, *A Focused Review of Operations and Thorium Exposures of the Dow Chemical Madison Plant*, concludes that it is “not likely that KCP waste handlers were exposed to a higher concentration [of airborne Th-232] on a 2,000-hour time-weighted-average (TWA) basis.”

**SC&A Status/Comments:** NIOSH again references the two bioassay data points identified for laborers and goes on to make a programmatic case that KCP had a robust contamination control program and that the monitoring data for uranium workers validate the bounding methods of the ER. However, with only two data points for laborers and some question as to whether both of these particular laborers conducted D&D, it is not clear how these bounding data would be applied for them. Assuming they were cleaning rooms where uranium machining had taken place (such as those in Department 20), it remains unclear why any such unmonitored workers conducting these activities in uranium-contaminated areas would not have the bounding uranium worker dose distribution applied for the D&D time period in question. (NIOSH’s case regarding thorium is more persuasive; SC&A agrees that these workers were unlikely to be exposed to residual thorium at concentrations in excess of  $1.5 \text{ E-11 } \mu\text{Ci/ml}$ ).

### **Issue 18: Incidents**

SC&A recommends closure. A review of classified records containing incident data did not uncover any additional reports worth including. With no new incidents to investigate or any new evidence that exposure incidents would make a difference in dose reconstructability, this issue should be closed.

### **Issue 20: Tritium**

In Rev. 01 to its white paper, *Tritium and Nickel-63 at the Kansas City Plant* (May 7, 2015), NIOSH has added more details regarding the operational history of tritium use at KCP and has added a last page that identifies an upper bound dose estimation in mrem/year for each identified tritium and Ni-63 operation at KCP.

**SC&A Status/Comments:** While the more specific treatment of bounding doses for each operation is helpful, NIOSH does not explain how that dose will be used in dose reconstruction, i.e., to whom it will be applied [only workers identified as handling tritium, all workers in certain parts of KCP (e.g., laboratory), or all workers at KCP during those specific timeframes]? A teleconference was held on June 29, 2015, to clarify possible avenues for performing sample dose reconstructions to validate that these bounding doses can be applied to a defined worker category. For Ni-63, SC&A concurs with NIOSH’s bounding analysis showing no external exposure potential and a bounding annual dose of 0.02 mrem/year, which the WG may consider a negligible exposure.