

TO: Linde Work Group  
Genevieve Roessler, Chair

FROM: Stephen Ostrow, SC&A

SUBJECT: Summary of SC&A White Paper Evaluating Various Documents Related to Linde Ceramics Plant Special Exposure Cohort (SEC) Petition 00107 and the Site Profile

DATE: April 9, 2010

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## **INTRODUCTION**

As part of its support for the Advisory Board on Radiation and Worker Health Linde Work Group (Linde WG), SC&A reviewed several documents, primarily employee interviews and statements, provided by an advisor to the Linde claimants in three different transmittals. As directed by the Linde WG, SC&A examined the documents to identify potential implications to NIOSH's Linde SEC-00107 evaluation or site profile that were not already addressed elsewhere, and reported its assessment in a white paper, dated March 29, 2010. This summary highlights the issues identified in the white paper in a form suitable for the general reader; SC&A noted two issues, both of which are currently being addressed by NIOSH.

## **WHITE PAPER SUMMARY**

SC&A examined the documents to determine if they raised any material issues that have not already been addressed or resolved by NIOSH, SC&A, or the Linde WG. "Material issues" is interpreted to mean issues potentially affecting dose reconstructions relying on the site profile or related to NIOSH's assertions regarding whether it can reconstruct doses with respect to SEC Petition 00107. Much of the contents of the documents relates to either general site history or conditions, or to specific worker histories (e.g., testimonies appealing compensation determinations), which are not considered material in this report. In addition, much of the information is repeated in multiple documents.

SC&A identified two issues meeting its criteria of unresolved and material—exposure to workers in tunnels under Linde buildings and exposure to welders using thoriated tungsten welding rods.

### **Tunnels**

Worker statements noted that a system of utility tunnels ran beneath various buildings of the Linde facility; the tunnels flooded when it rained or snowed, and contaminants would wash down into them. These tunnels are not mentioned, however, in the site profile or in the SEC review. SC&A believes that exposures to workers in the tunnels should be estimated. Although the issue has not been fully addressed, it was noted by the Linde WG during the January 25, 2010, teleconference on SEC Petition 00107. During that teleconference, NIOSH committed to developing a methodology for estimating doses, and SC&A was tasked by the WG to review

NIOSH's product when it is available. Hence, although this item is not yet resolved, the resolution process is underway.

### **Thoriated Tungsten Welding Rods**

Worker testimony called attention to the practice of performing thoriated TIG (tungsten inert gas) welding, during which the welder would grind the thoriated welding rod to cut it and to shape a point at the end. The process produced airborne dust, and there was no dust collection system or respiratory protection provided. SC&A looked at the literature to determine whether there could be a potentially adverse radiological health effect from inhaling and ingesting the slightly radioactive thoriated tungsten dust.

TIG welding is commonly used in the welding industry, as the addition of a few percent (1%–4%) of thorium to the tungsten greatly improves the welding process in several important ways. Expert assessments from welding industry organizations, researchers, and the U.S. Nuclear Regulatory Commission note that potential external exposures from tungsten electrode dust containing some radioactive thorium is minimal, but caution should be taken to minimize potential exposures from inhaling or ingesting airborne dust. Possible protective measures include proper dust collection, ventilation, and respiratory protection, particularly during electrode grinding operations.

Based on SC&A's brief review of the thoriated tungsten electrode issue, it believes that, even though the literature indicates that the dose to welders may not be significant, NIOSH should address the matter in a formal manner. Following an inquiry by SC&A during preparation of the white paper, NIOSH indicated that it was in the process of examining the issue on a complex-wide basis. Hence, while SC&A finds the issue material, it is currently in the resolution process, and SC&A will review NIOSH's approach when it is available.