



MEMO

TO: Advisory Board on Radiation and Worker Health Work Group on TBD-6000
FROM: John Mauro and Robert Anigstein, SC&A
SUBJECT: Review of NIOSH Approach to Estimating Doses to GSI Employees Not Routinely Working in Production Areas at GSI
DATE: June 4, 2013

In May 2013, David Allen transmitted a white paper providing details on the method NIOSH plans to use to reconstruct doses to GSI workers who were present at GSI during the radium era, but were not routinely present in the operational areas. The white paper was prepared in response to a request by the TBD-6000 Work Group during a work group meeting held on April 26, 2013. This memo presents SC&A's review of that white paper.

NIOSH has adopted a fundamental strategy that we believe is reasonable and claimant favorable for reconstructing external doses to GSI workers who were not directly involved in radiological operations during the radium era, but might have entered the radiological areas periodically as part of their responsibilities at GSI. The model assumes that such workers spent 25% of their time at the 2 mR/hr radiation protection boundary, and that these workers crossed that boundary once each shift. The assumptions used by NIOSH to estimate the annual doses associated with periodically visiting the operational areas are as follows:

- 3,250 hours per year working at GSI
- 30% load factor for radiography activities
- 25% of the time present at the 2 mR/hr boundary

Based on these assumptions, NIOSH derived the following annual external dose to penetrating radiation:

$$3,250 \text{ hrs/yr} \times 0.25 \times 0.30 \times 2 \text{ mR/hr} = 487.5 \text{ mR/yr}$$

In addition to these exposures, NIOSH assumed that the worker crossed the 2 mR/hr boundary once per shift and received 0.206 mR/shift, or 84 mR/yr assuming 406.25 shifts per year. The total external dose is therefore estimated to be $487.5 + 84 = 571.5 \text{ mR/yr}$.

SC&A agrees with these assumptions and the resulting annual doses for workers who were assigned administrative functions that did not require routine presence in operational areas during the radium era.