Review of the Advisory Board-Selected Case Reworked for the Evaluation of Aluminum Company of America – Pennsylvania Technical Basis Document Revisions (DCAS-PER-063, Subtask 4)

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DCAS-PER-063, "Aluminum Company of America – Pennsylvania (ALCOA-PN)"

- Issued June 2015 due to revisions to Aluminum Company of America – Pennsylvania (ALCOA-PN) site profile (Battelle-TBD-6000, appendix R)
- Revision increased inhalation, ingestion, and external doses during operational period
- Revision eliminated job categories and evaluates cases using job title of operator
- SC&A reviewed DCAS-PER-063 in July 2017: no findings

DCAS-PER-063, subtask 4 – review of one reworked case

- ABRWH selected one reworked case for SC&A's review April 2021, based on following criteria:
  - POC between 45 percent and 50 percent
  - assignment of external dose during the operational period
  - assignment of internal dose during the operational period
  - assignment of external dose during the residual period
  - assignment of internal dose during the residual period
- SC&A reviewed reworked case in September 2021

NIOSH reworked DR

- NIOSH's rework of the case:
  - Used applicable DR tools
  - Recalculated all annual doses
  - Re-ran IREP 30 times at 10,000 iterations per run
- Revised DR report not sent to DOL because the compensation decision did not change

SC&A's review of reworked DR

- SC&A' review was limited to reevaluation of pathways addressed in PER
- External and internal doses increased due to ALCOA-PN site profile changes
- Therefore, SC&A compared the original and reworked case for all exposure pathways

Case background

- Energy employee (EE) worked at ALCOA-PN for more than three decades
- EE worked throughout site
- EE was not monitored for radiation exposure
- Diagnosed with qualifying cancer several years after employment termination

Comparison of NIOSH's reworked doses with original doses

Dose categories	Reworked vs. original dose percentage
External	1860% increase
Medical	No change
Internal	1% reduction
Total	1055% increase
POC	905% increase

Original external dose calculations

- Used whole-body dose rates from table R.3 of Battelle-TBD-6000, rev. 0, appendix R, for operational and residual periods
- TBD-6000 job category: “Plant Floor High”
- Bladder assumed as surrogate organ for photon dose conversion factor (DCF) of 1.244
- Assigned external dose of ~0.500 rem

Reworked external dose calculations

- Used whole-body dose rates from table R.2 of Battelle-TBD-6000, rev. 1, appendix R, for operational and residual periods
- Bladder assumed as surrogate organ for photon dose conversion factor (DCF) of 1.244
- Assigned external dose of ~9.000 rem
- Significant increase in external dose resulted from increased dose rates during operational period

Original medical dose calculations

- Assumed preemployment, annual, and termination chest x-ray for operational period
- Urinary bladder assumed as surrogate organ
- Used dose data from table 6-5 of ORAUT-OTIB-0006, revision 03 PC-1
- Assigned external dose of >0.1 rem

Reworked medical dose calculations

- Assumed annual x-ray for each year of employment
- Urinary bladder assumed as surrogate organ
- Used dose data from table A-7 of OTIB-0006, revision 04
- Assigned external dose is unchanged from original DR

Original internal dose calculations

- Uranium intakes from inhalation/ingestion calculated based on tables R.1 and R.2 of appendix R, rev. 1
- TBD-6000 job category: “Plant Floor High”
- Compared types M and S solubility – type M more claimant favorable
- Assigned internal dose of ~0.300 rem

Reworked internal dose calculations

- Uranium dose assigned based on inhalation/ ingestion intakes from table R.1 of TBD-6000, appendix R, rev. 1
- Doses calculated for each operational/residual year
- Types M and S solubility compared – type M more claimant favorable
- Assigned internal dose nearly identical to original DR

SC&A's conclusions on external dose

- Reworked external dose:
  - Appropriate dose assigned based on appendix R, except for 1960–1968: NIOSH slightly overestimated the dose
  - Surrogate organ based on current revision of ORAUT-OTIB-0005
  - Doses entered into IREP correctly
- Reworked occupational medical dose:
  - Appropriate dose assigned based on OTIB-0006
  - Surrogate organ selection based on OTIB-0005
  - Doses entered into IREP correctly

SC&A's conclusions on internal dose

- Reworked internal dose:
  - Appropriate intake values used as specified in appendix R, except for one year NIOSH estimated a slightly lower dose
  - Input data entered into IMBA correctly
  - Assumptions are claimant favorable
- SC&A had no findings with the selected reworked case impacted by PER-063

Questions?