



# 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

<b>Dose categories</b>	<b>Reworked vs. original dose percentage</b>
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?