SC&A's Review of NIOSH's SEC-00253 Petition Evaluation Report for the Reduction Pilot Plant, Huntington, WV

Ron Buchanan, PhD, CHP

Advisory Board on Radiation and Worker Health, URAWE Work Group

February 17, 2022

SC&A's review of the evaluation report

- On September 2, 2020, SC&A was tasked with a review of NIOSH's ER for SEC-00253 for this focused group of workers and time period.
- SC&A's review cleared U.S. Department of Energy classification review in March 2021 and was delivered April 2, 2021 (SC&A, 2021).
- NIOSH issued a response to SC&A's review in a memo dated April 29, 2021 (NIOSH, 2021).

SC&A's review approach

- SC&A reviewed the 77 claimant records in the NIOSH DCAS Claims Tracking System (NOCTS) files associated with RPP to identify any information relevant to dose reconstruction (DR) feasibility for security personnel during the period from June 7, 1976, to November 26, 1978.
- SC&A found that a total of 44 claimants worked a portion or all of 1976 through 1978 at RPP.

SC&A's review results

- SC&A did not identify any information that would impact the feasibility of DR during the SEC-00253 period for security guards.
- However, given that a key facet of the proposed DR process includes the exposure time, it is important to assure that estimates of time spent during relevant activities are properly characterized and bounded.
  - "Exposure time" = time spent inside the facility where residual contamination was present.

Observation 1: Suggest further refinement of exposure time

- CATI information indicated that exposure time may be longer:
  - Original estimate was 15 minutes per day
  - Claimant A had to check all 7 floors and the perimeter
  - Claimant B estimated it took 30 minutes per day
- SC&A recommended that it may be beneficial for NIOSH to attempt to contact and interview security guards or other workers with specific knowledge of the surveillance activities to assure an accurate or (in the absence of specific occupational time) a bounding estimate of the time required to walk through the facility.
- Assumptions about exposure time should not preclude DR feasibility and can be considered site profile issues.

NIOSH's response to observation 1: Exposure time

- NIOSH's April 2021 revised estimate of time spent in the facility was 52 minutes per day, 6 days per week, for 250 days per year (260 hours per year).
  - Estimated 5 minutes per floor (based on original ER assumptions of time spent walking the building floor footprint with stops) multiplied by 7 floors.
  - Accounted for the physical dimensions of the lot at a walking rate of 4.4 feet per minute for the perimeter check (4.4 feet per *second* may have been intended).
- Increase in exposure time by a factor of approximately 3.

NIOSH's response to observation 1: Dose rate

- NIOSH (2021) used a maximum dose rate of 0.035 mrem/hour to complete the ER in a timely manner.
- NIOSH will evaluate all dose rate data.
- Site profile (NIOSH, 2018) will be revised to consider various dose rates.
- Site profile will be revised to add the standby period: May 1, 1963, through November 26, 1978.

NIOSH's response to observation 1: Overall annual dose

- The overall annual doses may be lower even when using the increased exposure time because of the lower dose rates obtained by considering all the available dose data.

SC&A's evaluation of NIOSH's response to observation 1

- SC&A concurs with NIOSH's reevaluation of the potential exposure time and finds it reasonable.
- SC&A concurs with NIOSH using the maximum dose rate to facilitate completion of the ER.
- SC&A finds it is appropriate to consider all applicable dose rate data in the revised site profile.
- SC&A recommends the time component be designated in abeyance pending review of the revised site profile (it may be important to review the revised dose rate approach).

Observation 2: Ingestion intake not addressed for SEC period

- Tables 3 and 4 of the site profile give ingestion intake values for production workers and administrative personnel during the operational and decontamination and decommissioning periods (NIOSH, 2018, pp. 13–14).
- However, the ER does not address potential ingestion intakes for the SEC period (though doses may be small).

NIOSH's response to observation 2

- Ingestion dose for the security guards can be estimated based on contamination levels.
- The ER used the bounding alpha contamination value of 19 dpm/100 cm^2 to estimate inhalation intakes.
- That value is applied to a 10E-4 m^2/hour ingestion coefficient from NUREG/CR-5512 (NRC, 1992) to derive a 0.19 disintegrations per hour alpha ingestion rate for the security guards.
- Details for assigning ingestion intakes will be included in the revised site profile.

SC&A's evaluation of NIOSH's response to observation 2

- SC&A concurs with NIOSH's recommendations to address ingestion intakes.
- SC&A recommends this observation be designated in abeyance pending review of the revised site profile.

Summary of site profiles issues

Observation 1: Exposure time

- SC&A concurs with NIOSH's reevaluation of the potential exposure time and all applicable dose rate data.
- SC&A recommends this observation remain in abeyance pending review of the revised site profile.
- SC&A recommends review of the revised site profile's approach to dose rate.

Observation 2: Ingestion intake

- SC&A concurs with NIOSH's recommendations to address ingestion intakes.
- SC&A recommends this observation be designated in abeyance pending review of the revised site profile.

Conclusions

- SC&A concurs with NIOSH that upper bounds can be established for internal intakes and external exposures.
- SC&A concurs that DR is feasible for security personnel during the SEC-00253 period.

Questions?

References

National Institute for Occupational Safety and Health. (2018). *Technical basis document for the Huntington Pilot Plant, Huntington, West Virginia* (DCAS-TKBS-0004, rev. 02). https://www.cdc.gov/niosh/ocas/pdfs/tbd/huntpp-r2-508.pdf

National Institute for Occupational Safety and Health. (2021, April 29). *Reduction Pilot Plant SEC evaluation report review* [Memorandum]. https://www.cdc.gov/niosh/ocas/pdfs/dps/dc-rppsec253-042921-508.pdf

SC&A, Inc. (2021). *SC&A's Review of NIOSH SEC-00253 petition evaluation report for the Reduction Pilot Plant, Huntington, WV"* (SCA-TR-2021-SEC003, rev. 0). https://www.cdc.gov/niosh/ocas/pdfs/abrwh/scarpts/sca-rppsec253-r0-508.pdf

U.S. Nuclear Regulatory Commission (NRC). (1992). *Residual radioactive contamination from decommissioning: Technical basis for translating contamination levels to annual total effective dose equivalent* (NUREG/CR-5512, PNNL-7994, Vol. 1). SRDB Ref. ID 23558