SC&A

Update on SEC-00235 (Area IV) and SEC-00246 (De Soto) Evaluations

Bob Barton, CHP

To the Advisory Board on Radiation and Worker Health

December 8, 2020

Topics to be covered

Evaluation of TRUMP-S program and 2012 EPA characterization study (memorandum dated July 25, 2019)

Summary of worker interviews conducted in 2018 and 2019 in support of the SEC-00246 evaluation (memorandum dated July 14, 2020)

Review of documentation provided by CORE Advocacy related to SEC-00235 (white papers dated November 25, 2019 and October 9, 2020)

Review and characterization of Boeing incident database (memorandum dated June 10, 2019)

Evaluation of TRUMP-S program and 2012 EPA characterization study

(memorandum, “Evaluation of Petitioner-Specific Concerns Regarding SEC-00235,” dated July 25, 2019)

Background for TRUMP-S and 2012 EPA HSA

- 2012 EPA historical site assessment (HSA) indicates work on the transuranic management by pyropartitioning – separation (TRUMP-S) for a 2-year period beginning in July 1988
  - Primary separation activities to occur in the hot lab (Building 4020)
  - Support operations to occur in Building 4023
- 50 total buildings identified in HSA list americium/thorium as a radionuclide of concern

SC&A review approach

- Review underlying references used in the EPA 2012 HSA to indicate TRUMP-S research
- Review additional references available as appropriate to the proposed TRUMP-S program

Timeline of key documentation (October 1988–July 1989)

- October 1988: internal letter proposing revisions to usage application for TRUMP-S material
- July 1989: planning meeting to obtain documentation to operate TRUMP-S glove box
- Mid-1989: planning document describing how TRUMP-S waste “to be generated” is to be handled in late 1989 or early 1990

Timeline of key documentation (October 1989–February 1990)

- October 1989: internal letter describing an upcoming “test readiness review”
- October 1989: internal letter describing necessary actions prior to beginning the radioactive portion of the TRUMP-S program
- February 1990: letter to NRC concerning a license amendment to allow the TRUMP-S program “to be conducted”
- February 1990: technical progress report
  - indicates Rockwell International was still awaiting DOE permission to “start up the test”
  - indicates it would be impractical to continue TRUMP-S activities at SSFL, search for an alternate facility is under way

Timeline of key documentation (February 1990–September 1993)

- February 1990: local newspaper article indicating public opposition to the “planned TRUMP-S project”
- May 1990: local newspaper article indicating the TRUMP-S project “originally scheduled to take place” at SSFL was relocated to the University of Missouri
- September 1993: D&D operations for Building 4023 completed; specific isotopic analysis not located

Timeline of key documentation (October 1994–February 1998)

- October 1994: confirmatory survey of Building 4023 performed for DOE
  - Building cleared for unrestricted release
  - Soil samples taken for uranium and cesium only
- February 1998: State of California Health and Welfare Agency, Department of Health Services, concurs that Building 4023 can be released without radiological restriction

Additional buildings identified in 2012 EPA HSA

- Purpose of HSA:
  - Identify “potential” contaminants that could be present
  - Aid in future sampling and remediation activities
- 50 buildings identified americium and/or thorium as a radionuclide of concern
- SC&A reviewed information for the buildings identified for potential americium/thorium contamination

SC&A review conclusions

- Attachment A of SC&A memo, “Evaluation of Petitioner-Specific Concerns Regarding SEC-00235,” discusses each building
- SC&A did not identify evidence of operational activities involving americium and/or thorium
- Residual contamination to be expected based on site history
- NIOSH to develop methods for reconstructing exposures during D&D and other remediation activities

Summary of worker interviews conducted in 2018 and 2019 in support of the SEC-00246 evaluation

(memorandum dated July 14, 2020)

Background for worker interviews

- 6 former energy employees interviewed in November 2018 and May 2019 (5 summaries confirmed)
- Focus was to obtain further insight on campaigns and radiological activities related to americium and thorium at De Soto
- Includes information on coordination with, or work in, Area IV

Summary of interviews

- Interviews suggest decladding of spent fuel did not occur at De Soto
- Interviews suggest that exposure to unencapsulated Am at De Soto is not probable
  - Other documentation suggests presence of contaminated material used in cleaning decladded fuel
  - Am contamination in Mass Spec Lab suggests unencapsulated Am may have been handled at least on bench-scale basis

Review of documentation provided by CORE Advocacy related to SEC-00235

(two SC&A white papers dated November 25, 2019 and October 9, 2020)

Background of records review

- Evaluation of SEC-00235 identified two primary issues:
  - Possible presence of thorium and americium and indications for dose reconstruction feasibility (TRUMP-S and TRU waste management)
  - Are operational conditions sufficiently bounding of residual conditions (required analysis of available air sampling data)?
- SC&A original SEC evaluation review (2017) did not identify evidence of internal exposure that precludes dose reconstruction feasibility
- Additional documentation submitted in 2019 and 2020
  - 2019 and 2020 SC&A responses provided to ABRWH
  - Neither identified sufficient evidence to preclude feasibility

TRU waste management

- No evidence TRU waste was generated by operations after 1988
- TRU waste managed at SSFL after 1988 due to legacy (pre-1989) operations and post-1988 D&D activities
- Because TRU waste contains plutonium, there would be americium buildup in the waste packages
- Dose reconstruction methods for americium and thorium under development by NIOSH using breathing zone data for D&D workers

Review and characterization of Boeing incident database

(memorandum dated June 10, 2019)

Background of incident database

- CORE Advocacy provided thumb drives containing incident files on Dec. 13, 2018
- SC&A asked to review the files in context of SEC-00246 and De Soto
- Files consist of 784 radiological incident reports and 486 unusual occurrence reports
- 95 reports, or 12%, are related to De Soto. 3 other De Soto-related reports were missing, but summaries were included in assessment

Two incidents of concern

- Report Identifier a-0492
  - 1965: EE was cutting and grinding an irradiated fuel element in a clean lab area
  - EE submitted bioassay sample with results of no detectable activity
- Report Identifier a-0654
  - November 1975: fuel element with xenon tag gas was inadvertently included in a batch of elements for destructive inspection and stripped of its cladding
  - Main exposure potential identified as krypton-85; not clear if fuel element had been irradiated

Conclusion from review of Boeing incident reports

- SC&A did not find any direct references to internal exposure to americium or thorium
- Most incidents involved uranium operations
- 1965 decladding incident involved cutting and grinding
  - Was it reported only because it occurred in a clean lab?
  - Did this activity also occur in the De Soto hot lab or other De Soto facilities?
- Unclear whether the 1975 decladding incident involved an irradiated fuel element

Status of SEC-00235 and SEC-00246 reviews

- SC&A believes dose reconstruction is likely feasible for both locations (Area IV and De Soto)
- However, the conclusion is dependent on dose reconstruction methods under development:
  - Americium and thorium at Area IV post-1988
  - Thorium at De Soto post-1964
  - Potentially americium at De Soto on a bench-top scale level
  - All are likely site profile issues
- Remaining source terms at Area IV (U, Pu, fission products)
  - Future data captures will assess breathing zone data during remediation period
  - Provide perspective on exposure potential during remediation versus operations (i.e., is the operational monitoring data bounding?)

Questions?