Savannah River Site (SRS) Citizens Advisory Board
Nuclear Materials (NM) and Facilities Disposition & Site Remediation Joint Committee Meeting
Aiken Municipal Conference Center, Aiken, SC
January 22, 2008

The Savannah River Site (SRS) Citizens Advisory Board (CAB) Nuclear Materials and the Facilities Disposition & Site Remediation Committees held a joint committee meeting on Tuesday, January 22, 2008, 6-8 p.m., at the Aiken Municipal Conference Center in Aiken, SC
The purpose of the meeting was to discuss:

1. K-Area Projects;
2. Spent Nuclear Fuel Project;
3. Status of Remedial Actions along Four Mile Branch; and
4. An opportunity for public comment on CAB related items.

Attendees:

CAB Members	Stakeholders	DOE/Contractors
Manuel Bettencourt, Chair	Rick McLeod, CAB Technical Advisor	Sheron Smith, DOE-SR
Judy Greene-McLeod, Vice Chair	Rob Pope, EPA	Pat McGuire, DOE-SR
Mary Drye	Heather Cartwright, SCDHEC	Robert Edwards, DOE-SR
Leon Chavous	Tom Rolka, SCDHEC	Charles Nickells, WSRC
Alex Williams	Jeff Allender, Public	Linda Bauer, WSRC
Wade Waters	Kimberly Wilson, SCDHEC	P. K. Hightower, WSRC
Donna Antonucci		Mark Schmitz, WSRC
Joe Ortaldo		Dawn Gillas, DOE-SR
Frank Boulineau		Paul Sauerborn, WSRC
Stan Howard		Phil Prater, DOE-SR
Karen Patterson		Barbara Key, WSRC
Bob Meisenheimer		Mike, Dunsmuir, WSRC
K. Jayaraman		Bill Swift, WSRC
		Paul Daughtery, DOE

Welcome, Introduction, and Committee Chair Update:
Manuel Bettencourt, NM Chair, and Mary Drye, FD&SR Chair, called the meeting to order at 6pm. They began by stating that this is a joint committee meeting of the Nuclear Materials Committee and the Facilities Disposition and Site Remediation Committee.

Mr. Bettencourt welcomed everyone and requested self introductions. He reviewed the meeting ground rules, and requested that all questions be held until the end of the presentations.

After the committee updates and recommendations review, Mr. Bettencourt announced that Mr. William Spader, the DOE-SR Deputy Manager for Cleanup has submitted his resignation. Mr. Bettencourt stated that many of the CAB members will recall that Mr. Spader was the Designated Deputy Federal Official and has worked closely with the CAB members for several years.

Meeting Summary:
The Nuclear Materials Committee and the Facilities Disposition and Site Remediation Committee held a joint committee meeting on January 22, 2008, 6:00-8:00 p.m. at the Aiken Municipal Conference Center, Aiken, SC. The agenda topics included presentations on the K-Area Projects; the Spent Nuclear Fuel Project; and the Status of Remedial Actions along Four Mile Branch.

The meeting was well attended and discussions well received. No issues or recommendations evolved from the discussions. Open and pending recommendations were reviewed by the committee chairs with a status update being recorded.

Dr. Linda Bauer, WSRC, provided an update of the current status of K-Area missions to include the Plutonium (Pu) Surveillance Program; the Pu Consolidation; Fire Protection Upgrades; the CSSC Project; the Pu Disposition Program; and the re-evaluation of mission need for two line item projects, CSSC and Pu Vitrification. She stated that the Savannah River Site (SRS) maintains safe storage of Pu in K-Area; surveillance and consolidation activities are ongoing; enhancements such as fire detection provide defense-in-depth to ensure continued safety, and SRS is continuing with project activity evaluations to ensure best value for the taxpayer is achieved. The CAB members requested that all facility schedules are linked based on the H-Canyon shutdown scheduled in 2019 and the Defense Waste Processing Facility program. The CAB also requested an update on the status of the line item projects (CSSC and Pu Vit) by the April-May timeframe.

The meeting continued with a presentation provided by Charles Nickell, WSRC, on the Spent Fuel Project Status. In 2006, the Department approved the Enriched Uranium (EU) Disposition Project Plan which included the H-Canyon facility to process Al-based Spent Nuclear Fuel (SNF). In 2007, the Department approved the EU Disposition Project Baseline. A Supplemental Analysis and Amended Record of Decision are being developed to designate H-Canyon processing of the Al-based SNF. Completion of the EU Disposition Project together with the SNF transfer will result in the elimination of the entire SNF inventory at SRS and reduce the number of shipments of SNF from DOE sites to the repository. Mr. Nickell stated that L-Area infrastructure can safely support the SNF Transfer Project storage needs integrated with ongoing Foreign Research Reactor and Domestic Research Reactor of SNF receipts and transfers to H-Canyon.

The last presentation was provided by Phil Prater, DOE-SR, on the Status of Remedial Actions along Four mile Branch. Mr. Prater discussed, in detail, the source of the contaminants and the three ongoing corrective actions are challenging and complicated but being aggressively pursued to reduce contaminates from reaching Four mile Branch. He stated that significant progress has been made in reducing tritium activity through the Sheet pile dam and rerouting the water through an irrigation system and evapotranspiration and then the water vaporizes to the atmosphere. A CAB member questioned the process impacts to the 22-acres of loblolly pines and could the trees eventually be harvested. The tritium processes through the pines within 8-10 months and can be harvested without any impacts to the trees. The echo system has been reviewed and appears to be normal. Barriers and Base injection are being used to reduce seepage contaminates from F Area and H Area to the Four Mile Branch. He stated there is a need to perform additional base injections to solve the Sr-90 issue in the creek and in the springs. In conclusion, Mr. Prater stated that SRS continues to develop and implement a technology to solve the I-129 contaminant issue. Mary Drye, Chair FD&SR, requested this presentation be provided to the full board at their meeting next week.

During the public comment period

Public Comment(s): Emil Bernard and Barbara Key stated their interests in becoming members of the Board.

Actions:

1. During the Fire Protection Upgrades discussions, Mr. Wade Waters, CAB member, asked where the axe and rope from the K-Area are. Have they been disposition, provided to the historical preservation efforts?
2. Provide an update on the line item projects: CSSC and Pu Vit.
3. Ensure all schedules are linked from H-Canyon to be complete by 2019 and DWPF.

Adjourn: The meeting was adjourned at 8:05pm.

Presentations below:

PRESENTATIONS:

K-Area Project Update *(presented by Dr. Linda Bauer, WSRC)*

Purpose

- Provide an update of the current status of K Area missions
  - Pu Surveillance Program
  - Pu Consolidation
  - Fire Protection Upgrades
  - CSSC Project
  - Pu Disposition Program
  - Re-Evaluation of Projects

Pu Surveillance

- KIS Operational Performance 06/07 -12/07
  - Completed 38 NDEs of 3013 containers
  - Completed 10 DEs of 3013 containers
- Positive results seen to date
  - KIS process has provided performance data.
    - Evaluated material has remained stable.
    - Integrity of 3013 containers and 9975 packages maintained through transport and storage.
  - No issues have been identified with
    - Gas generation
    - Pressure build-up
    - Corrosion

Pu Consolidation

- DOE authorization was issued 9/5/07 to consolidate surplus, non-pit Pu at SRS.
- Approximately 3000 containers are expected from Hanford, LANL and LLNL over a 2-year period.
- All material is to be received in K Area.
- Shipments have begun from Hanford and LLNL.

Fire Protection Upgrades

- Fire Detection capability added to KAMS
  - The addition of detectors was completed ahead of schedule and under budget in September 2007.
  - Completion of the project satisfies a congressional and DNFSB commitment.
  - Defense-in-depth improvement in the KAMS fire protection posture realized from this enhancement.
- Fire Suppression capability
  - Design is underway to add fire suppression in KAMS.
  - Completion of the project will satisfy a congressional and DNFSB commitment.
  - Defense-in-depth improvement in the KAMS fire protection posture will be realized from this enhancement.

CSSC Project

- CSSC Project will provide:
  - Long-term, higher through-put NDE/DE capabilities
  - Enhanced Pu storage flexibility for 3013 containers
  - Packaging capabilities
  - Furnace capability for stabilizing oxides

Pu Disposition Program

- Integrated Disposition Plan
  - DOE's plan for the disposition of the surplus non-pit Pu shipped to SRS involves:
    - H Canyon (existing)
    - Mixed Oxide Fuel Fabrication Facility (under construction)
    - Plutonium Vitrification Process (to be constructed)

Re-Evaluation of Projects

- Currently re-evaluating CSSC and Plutonium Disposition (Vitrification) Projects
- Seeking opportunities to better integrate approaches as we continue with project activities
- Determination to be made if vitrification is the best option for the taxpayer

Summary

- SRS maintains safe storage of Pu in K Area.
- Surveillance and consolidation activities are ongoing.
- Enhancements such as fire detection provide defense-in-depth to ensure continued safety.
- Continuing with project activity as we ensure best value for the taxpayer is achieved.

<u>Spent Fuel Project Status</u> *(presented by Charles Nickell, WSRC)*

Purpose

An update on SFP activity since our last meeting

- Successful End State
- SNF Transfer Project
- Al-based SNF Disposition
- Schedule
- L-Area Infrastructure
- Summary

Spent Nuclear Fuel Disposition

SNF Decisions

- 2006 DOE approved the Enriched Uranium Disposition Project Plan which included the H-Canyon facility at SRS to process Al-based SNF
- 2007 DOE approved the Enriched Uranium Disposition Project Baseline
- A Supplement Analysis and Amended Record of Decision is being developed to designate H-Canyon processing of Al-based SNF

Successful End State

Completion of the Enriched Uranium Disposition

Project together with the SNF Transfer will result in:

1. Elimination of the entire SNF inventory at SRS:
    1. Dissolution of ~11000 Al-based SNF assemblies currently at SRS
    2. Dissolution of ~3000 Al-based SNF coming from FRR and DRR
    3. Dissolution of ~4000 Al-based SNF assemblies coming from INL
    4. Transfer of ~2000 non-aluminum SNF assemblies at SRS to INL
2. Reduction of the number of shipments of SNF from DOE Sites to the repository
3. Recovery of a valuable national resource, useful fissile materials, for energy use
4. Elimination of the need for SRS to build and operate a SNF packaging and dry storage facility

Scope of SNF Transfer

- EM proposes to begin the transfer of SNF between SRS and INL in late 2009 and end in 2019
- Approximately 30 shipments per year for 10 years are being planned
- SRS/INL transfer shipments will be integrated with FRR/DRR shipments to SRS and on-site transfers of SNF from L-Area to H-Canyon

Spent Fuel Project Summary

- Elimination of the entire SNF inventory at SRS:
    - ✓ Dissolution of ~11000 Al-based SNF assemblies currently at SRS
    - ✓ Dissolution of ~3000 Al-based SNF coming from FRR and DRR
    - ✓ Dissolution of ~4000 Al-based SNF assemblies coming from INL
    - ✓ Transfer of ~2000 non-aluminum SNF assemblies at SRS to INL
- L-Area infrastructure can safely support DOE's SNF Transfer Project storage needs integrated with ongoing FRR and DRR SNF receipts and transfers to H-Canyon

Status of Remedial Actions Along Fourmile Branch *(presented by Phil Prater, DOE-SR)*

Groundwater Plumes

Three ongoing Corrective Actions

Three Major Issues

- Tritium
  - Tritium is radioactive hydrogen
    - RCRA permits call for major reductions in tritium concentration in Fourmile Branch
- Acid
  - Acid solubilized metals and metallic radionuclides
    - RCRA permits call for major reductions in metal and metallic radionuclide concentrations in Fourmile Branch
- Other non-metallic radionuclides
  - Iodine-129, has a very low standard (1pCi/L)

Corrective Action #1

- Tritium at the Mixed Waste Management Facility Southwest Plume
  - Plume is sourced from the Old Radioactive Waste Burial Ground consists principally of tritiated water and VOCs
  - Groundwater containing contaminants discharged into a spring area that was eventually released to Fourmile Branch and the Savannah River (over 1000 curies per year)
  - No treatment for tritium other than decay

Phytoremediation Effectiveness

- System operated since 2000
- Evapotranspiration is 80 to 90% effective
- Concentration of tritium in Fourmile Branch has been reduced by just under 70%
- We have identified no issues with the system

Corrective Actions #2 and #3 F&H Area Seepage Basins

Background

- The F and H Area Seepage Basins received acidic and radioactive liquids (including Tritium) from the F and H Separations Facilities
- Release created a low pH plume containing radionuclides (metallic and non-metallic)
- The acid stripped the formation of metals (including natural radionuclides) and minimized the retardation of contaminants
- The plumes discharge into Fourmile Branch

Original Remediation Strategy

- Releases to the basins were stopped in the mid 1980s
- The basins were capped in the early 1990s
- A pump / treat / reinject system was started in 1997 and terminated in 10/2003
  - Major extraction system
  - Consisted of ion exchange, reverse osmosis, and flocculation treatment to remove metals and metallic radionuclides
  - Injected tritiated water upgradient of extraction
- Cost over $1million a month to operate
- Did not have a significant impact on releases to Fourmile Branch

Remediation Strategy - Phase 2

Solution:

- Interrupt the flow of contamination to Fourmile Branch in the bottom of the aquifer, and decant off the top with a funnel
  - Pre-treat area with base before placement
- Treat the water in a gate with base to precipitate metals / metallic radionuclides

H Area Solution:

Barrier Walls

- Barriers for containment and gradient adjustment
- Option to use Base Injection in the future

Proposed Solution for Sr-90 at F&H

- Sr-90 concentrations occasionally exceed the standard near the barriers (much progress has been made)
- Have Sr-90 above the standard in some springs below the barriers
- Need to perform another base injection campaign at both F&H Areas that will fully treat the Sr-90 between the creek and the barriers
  - This will take several years to complete
  - It will take several years to see the benefits for the base

Proposed Solution for Other Non-Metallic Radionuclides

- Working a technical strategy to solve the I-129 problem
  - Studying silver solutions, colloids, and nano-particles
  - Silver and Iodine combine and form Silver Iodide which is very insoluble
  - Plan is to develop an injectable silver material that will sequester the I-129
    - Several years of technical development and testing prior to full scale implementation
    - Takes several years to see the impacts of the remedial efforts

Conclusions

- Significant progress has been made in reducing tritium activity in Fourmile Branch
- Nearing the Permit goals for tritium
  - Need to continue phytoremediation at the MWMF Southwest Plume
  - Monitor effects of the barriers at F&H; allow effect of barrier systems to continue to optimize
- Need to perform additional base injections to solve the Sr-90 problem in the creek and in the springs
  - Doable! (base works well, meet standards most of the time in creek)
  - May take several treatments and some time to see the effects
  - Starting treatments in 2008
- Continue development and implementation of a technology to solve the I-129 problem
  - Proof of concept completed
  - Lab work (soil column) testing
  - Plan some field tests after the additional base injection