SRS Citizen's Advisory Board

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Nuclear Materials Committee

Meeting Summary

March 27, 2001
Savannah River Site
Aiken, SC

The Savannah River Site Citizens Advisory Board (SRS CAB) Nuclear Materials (NM) Committee held a meeting on Tuesday, March 27 to hear presentations on the Highly Enriched Uranium (HEU) Blend-down Project/Program, the Unallocated Off-Spec HEU Study and the SRS Canyons Nuclear Material Identification Study.

CAB Members	Stakeholders	DOE/Contractors
Ken Goad*	Chuck Keilers, DNFSB	Sachiko McAlhany, DOE-SR
Jean Sulc*	Bill McDonell	Marggie Schwenker, DOE-SR, NNSA
Wade Waters	Mike French	George Klipa, DOE-SR
Bill Willoughby	Lee Poe	George Mishra, DOE-SR
		Don Bridges, DOE-SR
		Scott Boeke, DOE-SR
		Britannia Melton, DOE-IG
		Dean Tousley, DOE-HQ, NNSA
		Jim Bolen, DOE-SR
		Chuck Goergen, WSRC
		Donna Martin, WSRC
		Mike Dunsmuir, WSRC
		Peggy Pollock, WSRC
		Teresa Haas, WSRC
		Don McWhorter, WSRC
		John Dickenson, WSRC

***Committee members**

Ken Goad, newly elected CAB NM chair, opened the meeting by introducing the three DOE speakers. Marggie Schwenker, Office of Defense Nuclear Nonproliferation, National Nuclear Security Administration (NNSA), provided the first presentation on the HEU Blenddown Program. Marggie explained the functions of the NNSA, which includes the blenddown of HEU for commercial use. Stabilization of surplus plutonium and tritium recycle and extraction are other activities under the NNSA.

Schwenker said three drivers serve as the primary reasons for DOE to pursue blend down for commercial use by the Tennessee Valley Authority (TVA).

1. **It supports the U.S. nonproliferation goals by providing disposition of surplus HEU materials,**
2. **The Record of Decision (ROD) for the Disposition of HEU identified blenddown of HEU for commercial fuel as the preferred alternative,**
3. **The blenddown of HEU will meet 94-1/2000-1 commitments to the Defense Nuclear Facilities Safety Board (DNFSB) to stabilize SRS spent nuclear fuel (SNF) and the resulting solutions.**

The project goal is to transfer the off-specification HEU so that is can be used as fuel in commercial nuclear reactors owned by TVA. Schwenker said it is more cost effective at approximately $350 million as opposed to the alternative of blending the material to waste, which would cost greater than $900 million. In addition, TVA will save about 21% on fuel costs and DOE (the U.S. Treasury) and TVA will share in investment costs and savings above the TVA 21% saving.

Of the total surplus HEU owned by the U.S., about 38 metric tons will not meet the traditional commercial fuel specifications. The Interagency Agreement between DOE and TVA will specify approximately 33 metric tons of the off-specification material for use in TVA reactors. TVA has already successfully demonstrated the use of off-spec material during 1999-2000. The plan for the HEU is to process it and downblend it at SRS in H Canyon. TVA will take ownership at SRS and ship low enriched uranium (LEU) solution in a Nuclear Regulatory Commission (NRC) licensed container.

Concerning the status of the Interagency Agreement, Schwenker said DOE Secretary Abraham signed the agreement on February 8, 2001. The TVA National Environmental Policy Act (NEPA) review and public comment was expected by the end of March. The Environmental Assessment for the construction and operation of HEU facilities was completed and a FONSI was issued on November 3, 2000. Other preparations for the program include submitting a safety report to NRC for the shipping container for LEU. Refreshing the HEU solution will be complete in September 2001, a second dissolver will be prepared for an April startup and almost half of the irradiated SNF assemblies have already been dissolved.

A diagram presented by Schwenker showed the various operational interfaces—those that are DOE's and those that are TVA's. The material will come from storage in K Area, be dissolved and processed in H Canyon, blended from HEU to LEU in HA-Line of H Canyon and then will be sent to the loading facility. A TVA vendor will send natural uranium to SRS for the blenddown. TVA then takes ownership of the LEU once the material is loaded in shipping containers. The total project costs will be $99,600 million, with the first shipment of LEU planned for March 2003. The project is currently on schedule despite a one-month delay.

Schwenker said she expects the interagency agreement to be signed on March 28 2001 because it is a positive project for both sides. Chuck Keilers, DNFSB, emphasized however that there would be penalties and fines of up to $5 million if the first reload for the TVA power reactor is not completed by spring 2005. Therefore, TVA would have a vested interest in signing the agreement and getting underway.

Bill McDonell, public, asked what fraction of the total U.S. surplus HEU does the 33 tons designated for LEU represent. Dean Tousley, DOE-HQ, NNSA, said the total HEU surplus is 174 metric tons. Tousley then pointed out that NNSA is a separate organization and although a part of DOE, it will be "buying" the stabilization service from Environmental Management. John

Dickenson added that the HEU program would be a positive combination of stabilization and disposition work, crossing division lines to accomplish one common mission.

Concerning the budget, Lee Poe, public asked if DOE had the $99 million in hand for the project. Schwenker said DOE has spent $6,084 million and fiscal year 2001 costs are set for 22,928 million. Keilers added that DOE is baselining at 35% design.

In summary, Schwenker said TVA is investing as much time and money as DOE and both parties wish to see the project succeed. TVA will contract with a consortium of companies to build the oxide conversion facilities. New facilities are being built so that material such as plutonium, neptunium and U-236 are not introduced into the commercial industry. Keilers added that construction of new facilities demonstrates the value of recovering the material.

Scott Boeke, DOE-SR Materials and Facilities Stabilization, provided the second presentation on a study of Unallocated Off-Spec HEU co-sponsored by NNSA and the EM Nuclear Materials Stewardship program. The study was chartered in August 2000 as a joint effort between NNSA and EM. The report is currently in draft stage with a final planned for release in late May. The objectives of the study are to establish a baseline inventory of in-scope materials, define and analyze life-cycle management options, recommend to NN and EM a disposition pathway for every nuclear material item and work with sites to incorporate recommendations into baseline planning.

Boeke explained that this HEU is contaminated with plutonium-239 or other isotopes such as uranium isotopes, fission products or non-PU actinides. These materials could not be included in the initial inventory included in the TVA HEU blenddown project due to incomplete characterization, further analysis required, or other significant technical issues.

After identifying all of the off-specification material currently not part of an approved disposition program, the team of 10 individuals utilized several assumptions based on current Departmental policy to proceed with the analysis. Some of these assumptions include the following:

- **Pit Disassembly and Conversion Facility (PDCF) will be constructed to clean and oxide a majority of weapons pits,**
- **Weapons parts at sites across the complex have been declared excess by Defense Programs,**
- **H Canyon will remain operable until melt and dilute aluminum-clad fuels are demonstrated,**
- **Criteria for processing plutonium contaminated HEU at Oak Ridge's Y-12 plant are rigid,**
- **Commercial processing will be used to the maximum extent practicable,**
- **The HEU-PU oxide disposition will be fully supported via the plutonium immobilization program,**
- **SRS canyons will be used for difficult materials only.**

Boeke said the team used a systems engineering process to perform the study and develop the final recommendations. The nuclear materials were placed into 15 material groups, with 26 different disposition paths available (many of them SRS-related). The top three or four paths were selected for each group, then seven integrated scenarios were developed. Those scenarios were:

- **Balanced facility utilization (NN-60, EM, Y-12 and commercial)**
- **High prioritized path score for each material**
- **Maximize use of available canyon capacity**
- **Earliest schedule completion**
- **Maximize commercial processing (minimize canyon)**
- **Minimum action/deferred action case**
- **Minimum transportation; maximized onsite process.**

The scenarios were ranked by subject matter experts utilizing a set of relevant technical and programmatic criteria. It was determined there was little difference in preference of the top three scenarios. The team conducted further "custom analysis" to combine the best aspects of the top three into a new hybrid scenario, the "Window of Opportunity", which offered an optimized approach for disposition of unallocated, off-spec HEU. This "Window of Opportunity" scenario is characterized by the following general statements:

- **Most off-spec HEU not associated with plutonium is processed commercially**
- **Classified materials would be processed through the canyons**
- **Oxide meeting immobilization specification is processed through the Plutonium Immobilization Plant**
- **Small quantities are allocated to major canyon or commercial campaigns.**

Boeke said the biggest portion based on mass would be commercially processed. He pointed out, however, that there is always a disposition pathway off SRS for any material stabilized here.

Lee Poe, public, asked if NEPA coverage was needed for the actions to take place. Boeke said processing the majority of the material is covered under the Surplus HEU Environmental Impact Statement completed in 1996. Poe asked if some of the enriched material would go to the waste tanks. Boeke said some of the procedures could be changed to accommodate the enriched material if required.

In the last presentation of the day, George Klipa, DOE-SR Materials and Facilities Stabilization, discussed the SRS Canyons Nuclear Material Identification Study. The study, completed in February 2001, presents the results of over three years of examining nuclear material inventories, their disposition paths and their potential need for canyon processing. Klipa said the DOE Office of Management and Budget is currently reviewing it and once their review is complete, the study will be transmitted to Congress and the DNFSB.

The three-year study was co-lead by DOE-SR and the Office of Environmental Management. Several studies that led up to this final study include the Phased Canyon Strategy, the Processing Needs Assessment, and the WSRC Canyon Potential Analysis. The DNFSB 2000-1 Implementation Plan and the Nuclear Material Stewardship Initiative also impacted results of the study.

Klipa said disposition pathways for off-spec HEU and Mark 18A Targets are under active review to identify disposition paths. Only two materials—Pu-239/other transuranic scraps, samples and standards and lightly or unirradiated reactor fuel and components—have no baseline pathway. As noted by Boeke, the offspec HEU study will be completed in the April/May 2001 timeframe. The Mark 18As were part of the californium production campaign conducted at SRS during the 1960s and 1970s. The Office of Non-proliferation and National Security study is recommending that the Pu-244 be extracted, enriched and used for international safeguards verification analyses. The two main extraction options are SRS or the Oak Ridge National Laboratory.

The Pu-239 and other transuranic materials with significant remaining uncertainty are part of a larger inventory of materials with disposition paths to be determined. Defining disposition paths for lightly or unirradiated SNF is another category with disposition pathway uncertainties.

Klipa said DOE is confident that essentially all of the materials requiring canyon processing have been identified. Importantly, Klipa said none of the potential materials specifically require the use of the F Canyon PUREX process. In the category materials with non-canyon baselines no longer requiring canyon backup is the N Reactor fuel. The current plan is to ship the fuel directly to a geologic repository.

Bill Willoughby, CAB, asked what would SRS do in the post canyon era if materials need to be stabilized but there is no processing option left. Lee Poe asked if DOE would consider low level maintenance of the canyons. Sachiko McAlhany, DOE-MSF, said DOE continues to evaluate the need for the canyons but at some point a decision must be made on keeping the canyons open or selecting a different disposition path for economical reasons. Klipa added that DOE has a good understanding of the its nuclear material inventory and there should be no surprises.

Ken Goad asked if DOE has found any materials buried at DOE sites as they were completing the inventory. Don Bridges, DOE-SR MSF, stated that some U-233 was found buried at Idaho. DOE will keep aware that materials may be found later.

Poe asked if there have been any changes in the past three years of materials designated for processing through the canyons. Klipa said some materials have been shipped to the Waste Isolation Pilot Plant and specified for other disposition paths. Poe also said the public needs to know specifically when F Canyon will stop processing. Bridges said many activities would be conducted in F Canyon through 2006, with the exception of the PUREX process.

Chuck Keilers, DNSFB, added that the DNFSB has sent a letter to DOE emphasizing the opportunity to accelerate plutonium stabilization and packaging by minor modifications to FB-Line. The current DOE plan involves extensive modifications to 235-F."

Keilers also mentioned three DNFSB-related items.

1. **The DNFSB has a new recommendation 2001-1 on the SRS High Level Waste System**
2. **The DNFSB is not pleased with DOE's Implementation Plan for 94-1/2000-1 including concerns with the americium/curium project, suspension of the Plutonium Immobilization Plant and other concerns with long-term storage of plutonium**
3. **The DNFSB will host a public meeting dealing with DOE quality assurance processes. The CAB was invited to sit in on video conferencing of the meeting at the SRS DNFSB office.**

Copies of the meeting handouts may be obtained by calling 1-800-248-8155.