SRS Citizen's Advisory Board

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Nuclear Materials Committee

Meeting Summary

April 25, 2000
North Augusta Community Center
North Augusta, SC

The Savannah River Site Citizens Advisory Board (SRS CAB) Nuclear Materials (NM) Committee held a meeting on Tuesday, April 25 to hear presentations on surplus plutonium disposition activities at SRS and on the SRS Spent Nuclear Fuel (SNF) Management Final Environmental Impact Statement (EIS).

CAB Members	Stakeholders	DOE/Contractors
Tom Costikyan	Craig Marrower, SCDHEC	Dan Bruner, DOE
Ken Goad	Russ Messick	Allison Blackmon, DOE
William Willoughby	Trish McCracken	Don Bridges, DOE
Lane Parker	Dusty Hauser, Sen. Cleland's Office	Randy Ponik, DOE
Brendolyn Jenkins		George Mishra, DOE
William Lawrence		Marc Woodworth, DOE
Charlene Townsend*		Mike Dunsmuir, WSRC
Jean Sulc*		Donna Martin, WSRC

*CAB NM members not present

Surplus Plutonium Disposition Activities

Tom Costikyan, CAB NM chair, asked attendees for introductions, then welcomed Dan Bruner, DOE-SR Materials and Facility Stabilization (MSF), to give a presentation on Surplus Plutonium Disposition Activities at SRS. Bruner prefaced the presentation by stating he and Allison Blackmon seated in the audience, work for the Nuclear Materials Disposition Division (NMDD) and that they were two of about 40 employees at SRS recently placed in the newly created National Nuclear Security Administration. He also said Charlie Anderson, manager of DOE-SR NMDD, asked for feedback from the afternoon's meeting so he would be prepared to answer any outstanding questions during the presentation scheduled for the full CAB on May 23 in Savannah.

Bruner began the presentation by explaining that a Surplus Plutonium Disposition Program was considered by the United States as essential for international nonproliferation of weapons-useable material. The program focuses on identifying technical solutions for both countries to dispose of approximately 50 tons of surplus plutonium declared surplus by each country. In a decision made this year, DOE stated it would pursue two pathways to dispose of the material—by immobilizing some of the plutonium in high-level waste and by burning the plutonium in a commercial reactor as plutonium oxide.

According to Bruner, these decisions were made through a very extensive National Environmental Policy Act (NEPA) environmental impact statement (EIS). The EIS evaluated 16 alternatives at various sites and

with a combination of technologies. The Final EIS, completed in December 1999, listed the hybrid approach with MOX and immobilization as the preferred technologies and SRS as the preferred site for three disposition facilities. The decision was made official in January 2000 when DOE announced the Record of Decision.

Activities at the Pit Disassembly and Conversion Facility (PDCF) will include the disassembly of nuclear weapons pits and converting the resulting plutonium to a declassified oxide form. The material would then go to either the MOX facility or the immobilization facility. The Advanced Recovery and Integrated Extraction System (ARIES), being developed by Los Alamos National Laboratory, will be used to conduct the conversion.

In the immobilization facility, about 17 tons of plutonium metal and oxide will be converted to an immobilized ceramic form, sealed in cans and placed in canisters to be filled with vitrified high level waste. The waste will be stored at SRS until shipment to a national repository. Much of the plutonium destined for the immobilization facility is excess plutonium scraps remaining from the production of weapons components.

The higher grade material will be converted to MOX fuel, shipped to be irradiated in commercial reactors owned by Duke Power, and then disposed of in a national repository as spent fuel. The plutonium would be mixed with depleted uranium to form MOX pellets. The pellets would be placed in a tube, then into a fuel assembly. Bruner explained that plutonium would not be recycled; the ultimate goal is to produce spent fuel, which the National Academy of Sciences said is a sufficient form to meet nonproliferation requirements.

Although DOE is preparing to stabilize and disposition 50 metric tons of plutonium, Bruner said to date, only about 34 metric tons have been declared excess. Bruner restated that of the 50 metric tons expected, 33 tons would be dispositioned with MOX and 17 dispositioned by immobilization. Bill McDonell, stakeholder, asked why the plutonium had to be placed in separate containers rather than mixed in with the borosilicate glass. Bruner said the Defense Waste Processing Facility (DWPF) process is designed to handle waste without fissionable materials. DOE did not intend to disrupt or impact DWPF or deal with the potential of criticality.

To successfully conduct the plutonium disposition activities, Bruner said there were a number of different organizations who will participate. DOE-HQ heads program management, DOE-HQ and SR handle project management, contract management is headed by DOE-Chicago, DOE-SR handles site management, review of deliverables, infrastructure project, WSRC oversight and facility ops oversight. WSRC is the design authority for the PDCF and immobilization facility and Duke/Cogema/Stone and Webster (DCS) is the design authority for MOX. George Mishra asked if any U.S. reactors were using MOX fuel. Bruner said Europe uses MOX but not the U.S. However, the U.S. Duke reactors will be modified to burn MOX through licensing amendments.

The facilities will be located in F Area outside of the fence in the general area where the Actinide Packaging and Storage Facility (APSF) work was started. The PDCF will be located in the middle of the three facilities.

Bruner then described the three major mission lines—Environmental Management, Nonproliferation and National Defense—at SRS. The integrated plutonium complex crosses all three lines, he explained. The schedules to begin construction for the facilities place the PDCF in 2002, MOX in 2003 and immobilization in 2004. The following is the materials dispositions (MD) overall budget in millions: FY1999 ($368.7), FY2000 ($169.8) and FY2001 ($223.4), The DOE-SR budget scenario is: FY1999 ($12.6), FY2000 ($17.0) and FY2000 ($20.9). At the peak of employment in 2005, a workforce of about 2000 is projected for a limited duration.

As Bruner described the operation of the three facilities in greater detail, he said the MOX facility would be privatized, licensed by NRC, and SRS will provide the infrastructure needs. Funding for facilities will be obtained in phases, with the "design only" phase currently underway. Bruner added that DOE-Chicago was selected to handle contract management because contractors had to be selected before the EIS was completed. DOE felt contract management through the DOE-Chicago would allow DOE to conduct an unbiased bid process.

Concerning the immobilization process, Bruner said 28 cans of ceramic plutonium cans would be placed in the DWPF canisters. The number of high level waste canisters would only increase by 10% or 600 canisters.

Congress requires a bilateral agreement with Russia before any of the surplus plutonium work begins. The Russians intend to burn MOX for final disposition and for energy purposes. Russia does not support immobilization because they believe it wastes the energy value of plutonium and it can be recovered. Bruner emphasized that there are easier ways to produce plutonium rather than attempting the complicated recovery of lower-grade plutonium from buried borosilicate glass.

In closing, Bruner said challenges ahead include gaining a bilateral agreement with Russia, the short 10-year window to dispose of the material, the respective roles of DOE, NRC and the Defense Nuclear Facilities Safety Board, and potential budget limitations. Risk and technical issues include identification and disposal of byproducts, design capacities, regulatory issues, and schedules. Bruner said site services would be a separate project from normal SRS infrastructure.

For more information, Bruner suggested the public review fact sheets and other informational materials on the DOE Headquarters website, Office of Fissile Materials Disposition, 42500nm.htmlwww.doe-md.com

Costikyan asked for a status of agreements with Russia. Bruner said Laura Holgate, DOE Assistant Deputy Administrator for Fissile Materials Disposition, is actively involved with negotiating the agreement that could be signed as early as June 2000.

Another question was asked on why the APSF had been suspended. Bruner said with the announcement of plutonium missions at SRS, DOE-SR saw a potential of integrating the activities with other SRS storage activities. Upgrading 235-F, an existing facility located near the proposed location of the plutonium disposition facilities, is being considered.

Opportunities of upcoming public participation in the plutonium disposition activities will occur when the license application to burn MOX in a commercial reactor is submitted to the NRC and when DCS develops an environmental impact statement to NRC.

Trish McCracken asked about the labor force in Charlotte, the DCS headquarters and if any SRS employees would be relocated. Bruner said SRS employees were not required to move to Charlotte. He also stated the contractor has already opened a satellite office in SRS to conduct business.

SRS Spent Nuclear Fuel (SNF) Management Final Environmental Impact Statement (EIS).

Marc Woodworth, DOE MSF, began his presentation by stating that DOE has been preparing the SRS SNF EIS for several years to determine the most efficient ways to manage 68 metric tons of heavy metal (MTHM) SNF at SRS. Woodworth explained that DOE seeks to extend the decisions made through several EISs previously completed. Those EISs include the *DOE Programmatic Spent Nuclear Fuel and Idaho National Engineering Environmental Laboratory (INEEL) Environmental Restoration and Waste Management Programs EIS*, the *Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel EIS*, and the *SRS Interim Management of Nuclear Materials EIS*. The first EIS determined the DOE sites where various SNF would be managed, the second determined

that foreign SNF would come back to the U.S. for disposition and the third determined how nuclear materials at SRS would be stabilized.

One of the major goals of the EIS was to identify a non-chemical separation process to stabilize SNF. Another was to decide to construct a new facility or modify an existing facility to conduct the SNF packaging and stabilization activities. Woodworth said the EIS evaluated many possible treatments, and selected the most viable ones for more extensive evaluation.

Of the 68 MTHM of SNF, the fuel was categorized in three separate groups based on mass. SNF already stored at SRS in wet storage consisted of 20 MTHM, foreign and domestic fuel comprises 28 MTHM, and 20 MTHM of stainless steel and zirconium-clad SNF to be shipped to INEEL were placed in the third category.

The technologies reviewed for stabilization of aluminum-based SNF included direct disposal/co-disposal, melt and dilute, mechanical dilution, vitrification technologies, electrometallurgical treatment and conventional processing. DOE then evaluated the technologies for maximum and minimum impact, looked at direct disposal, identified a preferred alternative and evaluated a no action alternative.

The preferred alternative combined processing of fuel posing potential safety and health concerns in the canyons and stabilizing the remaining SNF using the melt and dilute process. Woodworth said melt and dilute was one of the more simple new processes, it could be brought online more quickly, and it met nonproliferation goals. In addition, the process was flexible because the amount of depleted uranium and poison products used to lower the HEU in the fuel could vary.

Costikyan asked when SRS would send the stainless steel/zirconium to Idaho. Woodworth said it would be sent when the Receiving Basin for Offsite Fuel (RBOF) is closed. Costikyan asked if the fuel could be sent earlier so that RBOF could be closed and money saved. Don Bridges, DOE-MFS manager, said in a agreement between the Idaho and DOE as a result of a lawsuit, Idaho will not take the fuel until 2010. The amount of aluminum-based SNF from INEEL to SRS is 5 MTHM.

In describing the melt and dilute process, Woodworth said fuel elements would be melted in a furnace, depleted uranium and poisons would be added to bring the material to at least 20% low enriched uranium or below to meet nonproliferation standards, then metal ingots are formed. About 10 ingots in cans would be placed in the shipping container with the vitrified high level waste canister and shipped to a national repository. A large-scale pilot facility to test the melt and dilute process will be completed by the end of 2001. The final design for the test facility will be completed by the end of FY2000.

Ken Goad, CAB NM vice-chair, asked for the cost of the melt and dilute facility. Randy Ponik, DOE-MFS manager of the alternate technology program, said the preconceptual design was a green-field model, a facility built from the ground up. DOE is looking a modifying existing facilities, however, and a current quote could not be given.

Concerning the Tech-22 report from the DNFSB citing concerns with the melt and dilute process, Woodworth said DOE's response in the final EIS stated the canyons would remain open until the technology is demonstrated. The specifics will be stated in the Record of Decision expected in mid-May.

In final discussions, Trish McCracken asked who wrote the SRS SNF EIS and how data was generated for Table S-10 in the Executive Summary. Woodworth said TetraTech NUS was the outside contractor that wrote the report, with DOE oversight. George Mishra, DOE Public Accountability, said he would take the action to provide information to McCracken on the table.

For copies of meeting handouts call 1-800-249-8155.