



## **SRS Citizens Advisory Board**

### **Nuclear Materials Committee**

#### **Meeting Summary**

October 22, 2001  
Sheraton Augusta Hotel  
Augusta, GA

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The Savannah River Site Citizens Advisory Board (SRS CAB) Nuclear Materials (NM) Committee held a meeting on Monday, October 22, 2001 to discuss upcoming projects and issues dealing with nuclear materials and spent nuclear fuel stabilization and storage.

#### **CAB Members**

Ken Goad\*  
Jean Sulc\*  
William Lawrence\*

#### **Stakeholders**

Trish McCracken

#### **DOE/Contractors**

George Mishra, DOE-SR  
Mike Munsmuir, WSRC  
Donna Martin, WSRC  
Bill Condon, WSRC  
John Dickenson, WSRC  
Diane Koehne-Singer, WSRC

#### **\*NM Committee members**

Ken Goad, NM chair, opened the meeting and stated the committee would hear a summary of upcoming projects. That list included:

- Canyon utilization
- Progress on Am/Cm disposition
- Progress on FB-Line Pu Packaging and Stabilization Project
- HB-Line Phase II Startup and Operation
- L-Basin Storage Capacity and it's relationship to Treatment and Storage Facility (TSF) Operation
- FY2002 SRS Spent Nuclear Fuel Integrated Management Plan
- Status of L-Area Experimental facility and the future of Melt-and-Dilute Technology for SNF disposition
- Schedule for deactivation of Receiving Basin for Offsite Fuels

He first introduced John Dickenson, WSRC 94-1 Program Manager, Nuclear Materials Management Division. Dickenson said he was responsible to the NMMD vice president to stabilize legacy materials—nuclear materials remaining from the Cold War—store the material and transition it to a disposition program. Dickenson then proceeded to discuss the four topics dealing with nuclear materials.

#### **Canyon Utilization**

The F and H Area canyons are primary facilities onsite that process nuclear materials. The canyon are similar in design but do have different functions. The material currently being processed are either SRS materials or materials that were received by SRS in the past. The stabilization work begin in 1995 as a result of recommendations from the Defense Nuclear Facilities Safety Board (DNFSB), an organization that provides independent oversight of DOE facilities and reports to the Office of the President.

Concerning the activities of each canyon, Dickenson said F Canyon performs plutonium-related stabilization. Currently, Purex operations are scheduled to cease in 2002, although other functions of the canyon will likely continue through 2007-2008. Plutonium residues and process solutions are converted to plutonium metal for long-term storage until the plutonium disposition program is established. The FB-Line, also part of the canyon, will operate within the next four or five years, Dickenson said. Certain plutonium residues will be prepared for operations in H Area.

H Canyon is used to stabilize spent nuclear fuel as a result of policy decisions made by DOE since 1995. Stabilization of SRS fuel rods will continue through the next three years. Afterward, H Canyon will be used to downblend highly enriched uranium to low enriched for use as commercial spent nuclear fuel following an inter-agency agreement with the Tennessee Valley Authority.

Future actions in H Area will be to stabilize neptunium, a material designated for programmatic uses to produce pu-238 as a heat source for U.S. satellites. Other potential future activities for H Canyon could be stabilization of additional off-specification material from other sites for stabilize at SRS. This would only increase the current off-spec inventory by 10 %.

Trish McCracken, public, asked if the canyons operated 24 hours a day. Dickenson said the canyons are continuously staffed although the processes are not continuous. William Lawrence, CAB, asked if the stabilization activities lowered the radioactivity in the material. Dickenson said the materials are converted to a more stable form for storage only.

#### Progress on Americium/Curium Project

Dickenson said DOE has decided to suspend work on stabilizing the americium/curium in glass in the Multi-Purpose Plutonium Facility in F Canyon. The optional path now is to transfer the material to the high level waste system to be stabilized within the Defense Waste Processing Facility (DWPF). The proposed action would likely occur in 2003 and the material will be included with Sludge Batch #3.

Dickenson emphasized that WSRC is evaluating the option although the final decision on how to stabilize the material will not be made until later. Once a decision is made, an amended Record of Decision on the Interim Management of Nuclear Materials Environmental Impact Statement, 1995, would be necessary.

#### Progress on FB-Line Plutonium Packaging and Stabilization Project

As stated earlier, Dickenson said SRS is responsible to stabilize legacy nuclear materials. He described the current process of converting plutonium residues and solutions to a solid metal form and to oxides for long-term storage. Presently SRS does not have the capability to fire plutonium to 1000 degrees centigrade to meet DOE's standard long term storage requirements of 50 years. DOE is now proposing to modify FB Line and upgrade an existing furnace to meet that capability and to install equipment to meet the double-can 3013 storage requirement.

Dickenson said there would not be any technological challenges; the modifications would consist primarily of upgrades in the 221-F building. Trish McCracken, public, asked if an air permit was

needed. Dickenson said DOE currently holds a permit for F Area and that it would be evaluated to determine if a modification to the existing permit with the state was necessary.

#### HB-Line Phase II Startup and Operation

Phase II of HB-Line will allow for DOE to convert plutonium to plutonium oxide, as Dickenson had mentioned earlier. After operational readiness reviews, activities could be completed by 2006.

#### L-Basin Storage Capacity and its relationship to Treatment and Storage Facility (TSF) Operation

Bill Condon, Spent Fuel Program Manager, Nuclear Materials Management Division, opened the spent nuclear fuel portion of the meeting by describing the types of spent nuclear fuel being stored and stabilized at SRS. One type of fuel is the spent nuclear fuel used to run the SRS production reactors. This material will be processed through the H Canyon. The other types of fuel are highly enriched uranium fuel rods the United States supplied to foreign and domestic universities for research. As part of the agreement, the spent fuel rods were to be returned to the U.S. to avoid proliferation of the uranium.

According to Condon, the domestic reactor fuel return program will last until 2035. Fuel return for foreign research reactors would be complete by 2009. The returned fuels are being stored in L Basin. The basin contains about three million gallons of purified water—equivalent to 100 swimming pools. A typical fuel element is about three feet long and four inches square. Elements are placed in storage tubes, placed in a rack and stored in the water-filled L Basin. The preferred disposition option for the research reactor fuel involves the utilization of melt and dilute technology in the Treatment and Storage Facility (TSF). This is a new facility which may be available as early as 2009. Without a disposition option, the L Basin will be filled to capacity with spent fuel by 2011.

#### Status of L-Area Experimental Facility and the future of Melt-and-Dilute Technology for SNF disposition

All SRS spent fuel will be recycled and chemically processed through the SRS canyons. DOE made a decision in 2000 to look at the melt and dilute process as an alternate technology to stabilize research reactor spent nuclear fuel.

Condon said DOE would begin testing the melt and dilute technology on a pilot scale at the L Area Experimental Facility during fiscal year 2002. Condon explained that the fuel contains as much as 90 percent enriched uranium. With the melt and dilute technology, the fuel will be melted down and blended with depleted uranium, then formed into an ingot. The ingot will be placed in the middle of a canister filled with glass logs from DWPF. Condon said this process reduces volume, and the resulting waste form is believed to be suitable for disposal at Yucca Mountain following discussions and approval with the Nuclear Regulatory Commission.

The L Area Experimental Facility has been constructed in L Reactor and if the melt and dilute technology is proven the Transfer and Storage Facility (TSF) will also be built within the existing structure of L Reactor. Condon said DOE could save money by using existing structures and their support and security systems. The TSF will likely start up no earlier than 2009 and store the ingots until shipments to the repository begin between 2011 and 2015.

#### Schedule for Deactivation of Receiving Basin for Offsite Fuels

The Receiving Basin for Offsite Fuels (RBOF) is smaller than the K and L Basins, containing approximately 500,000 of purified water. Currently the schedule is to transfer all RBOF fuel to L

Basin by 2006 and to stop operation of the facility. Such a consolidation would free up funds used to operate and maintain RBOF.

**FY2002 SRS Spent Nuclear Fuel Integrated Management Plan**

Condon said this plan offers a detailed description of the Spent Nuclear Fuel Program at SRS through 2030. It is revised annually. The 2002 revision of the plan is currently in its last stages of review and will be available to the CAB NM committee around January 2002.

*Meeting handouts may be obtained by calling 1-800-249-8155.*