SRS Citizen's Advisory Board

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Joint Subcommittee Meeting:

Nuclear Materials Management
and
Risk Management & Future Use

Meeting Summary
May 12, 1997
Savannah, Ga.

The CAB Nuclear Material Management and Risk Management & Future Use subcommittees held a joint subcommittee meeting on Monday, May 12 at the Marriott Riverfront Hotel in Savannah, Ga. Citizens Advisory Board (CAB) members attending were Tom Costikyan, NMM chair, Suzanne Matthews, RM&FU chair, Ed Tant, Brendolyn Jenkins, Jonathan Hollingsworth, Kamalakar Raut, Lane Parker, Bill Adams, Mary Elfner, Jimmy Mackey, Arthur Belge, and Walt Joseph, CAB facilitator. Savannah River Site resource personnel attending included Donna Martin and John Dickenson, Westinghouse Savannah River Company, Jean Ridley, Associate Designated Deputy Federal Officer, and Don Bridges, both of the Department of Energy-Savannah River. The South Carolina Department of Health and Environmental Control was represented by Shelley Phipps and Tim Mettler. Bob Matthews and Trish McCracken from the public also attended.

Introduction: Stabilization of Onsite Nuclear Materials

After a brief summary by Costikyan and Matthews on the subcommittees` combined meeting, Don Bridges, DOE-SR was introduced. Bridges said his presentation would cover several topics of nuclear material stabilization, but he emphasized DOE-SR is focusing energies and budget on stabilization of SRS nuclear material inventories, first and foremost.

He explained Savannah River Site had produced material for nuclear weapons from the 1950s until the end of the 1980s. When the Cold War ended, operations stopped and much of the material was left in place. As the years progressed, DOE realized the need to put the material left in the pipeline in a more stable form. CAB member Jonathan Hollingsworth asked Bridges to describe ÒunstableÓ forms. Bridges said an example of an unstable form is material in liquid form. A stable form is material that can be safely stored for 50 years.

In describing current operations at SRS, Bridges said the five reactors once used to produce tritium are now shutdown. Two reactor disassembly basins and the Receiving Basin for Offsite Fuels are being used currently to store spent nuclear fuel. Both chemical processing facilitiesÑF and H canyonsÑare in use to stabilize site nuclear material inventories. F Canyon is fully operational while H Canyon, only partially operational now, will become fully operation in July

1997. Other facilities operating at SRS include the tritium facilities and the Defense Waste Processing Facility (DWPF).

Bridges then described the present canyon operations. He explained the canyons are currently being used to stabilize corroding targets and spent nuclear fuel in the wet basins and the solutions left in the canyon pipeline when processing stopped in the late 1980s. The immediate safety hazards were identified by both DOE and the Defense Nuclear Facilities Safety Board Recommendation 94-1. Treatments were identified under the Interim Management of Nuclear Materials environmental impact statement. (See attached presentation for SRS Nuclear Material Inventories). Bridges emphasized 98% of the material at SRS is stable while the remaining 2% require various methods of stabilization. Of the 43 stabilization milestones identified since 1994, 23 of those have been completed. All materials (except neptunium) should be stabilized by 2002.

Bridges was questioned on the waste generated from processing the materials. He said the higher fission product wastes are sent to the high-level waste tanks then to the Defense Waste Processing Facility. The lower level, long-lived transuranic wastes (waste containing concentrations of plutonium and uranium) would be sent to the Waste Isolation Pilot Plant in New Mexico.

Stabilization of Offsite Materials

Stabilizing offsite materialsÑRocky Flats and Hanford residue specificallyÑis one potential activity being considered at SRS by DOE. The material is in the form of plutonium residues, metals, and oxides. Plutonium concentrations in 40 metric tons of the 100 metric tons of residue at Rocky Flats is too high to be stored at WIPP. Bridges provided a chart of the quantity of material and where it could be stabilized, adding SRS has historically stabilized material from Rocky Flats. He also said stabilizing the Rocky Flats material would not affect the schedules for stabilizing SRS inventories.

He also described the type of non-corrosive stainless-steel containers (called 3013) used to ship and store the plutonium. All of the containers meet DOE and International Atomic Energy Agency (IAEA) guidelines for inventory control and would be stored in a safe and secure area, Bridges added. All products are then suitable for a plutonium disposition program.

Answering questions of the transportation of the residue, Bridges said the material would be packaged and stabilized before being shipped. The Department of Transportation (DOT) has codefied regulations on what can be shipped and what cannot be shipped. Shippers must meet DOT guidelines, he added.

Several other questions on safe transportation were raised, in particular the amount of heat within a container and a concern the containers would ÒsweatÓ and have water vapor. John Dickenson, WSRC, said the material is packed in an inert environment surrounded by helium and condensation would not occur.

The related environmental impact statement is the Rocky Flats Plutonium Residue and Scrub Alloy EIS, with the draft planned to be out for public comment in July 1997.

Dispositioning Excess Weapons-Grade Nuclear Materials

Potential longer-range plans of nuclear material stabilization being considered at SRS is the disposition of about 50 tons of surplus weapons-grade plutonium, Bridges stated. The plutonium is in metal, oxides, scrap and/or pit form. Bridges explained DOE has already made the decision to either immobilize or burn the plutonium as a mixed oxide in commercial reactors. SRS can support both processes, Bridges said.

Can in can is the process recommended for immobilization where the plutonium is vitrified or ceramified in a small cylinder, placed in the DWPF canister and high level waste is poured around it. This process has been successfully tested with material mimicking plutonium. Bridges said the high-level waste is a form of self-protecting criteria. He added that SRS is pouring about 100 DWPF canisters per year.

A question on the cost of immobilization versus reactor fuel was asked. Bridges said the costs are comparable. Tom Costikyan, NMM chair, suggested the generation of electricity would be a big benefit and a plus for the reactor option. Bridges said there would be a large cost to build an infractructure to produce the MOX fuel, although such a facility would likely be less costly at SRS since much of the infrastructure already exists.

Some questions on the mixed-oxide options and related costs were asked but Bridges said he would provide more information at the end of the meeting

Bridges also included the possibility of blending down 150 metric tons of highly enriched uranium to low-enriched uranium. SRS is one of four sites being considered to conduct the blend down process.

Bridges concluded the discussion of nuclear material stabilization with what he said were five activities comprising the SRS Vision: (1) plutonium pits disassembly with the ARIES process (2) building a MOX plant (3) processing materials into more stable, workable forms, (4) use of DWPF to immobilize plutonium and (5) safely storing material in vaults until final disposal. He added the consolidation of plutonium inventories, storage and processing will be required to support all the technologies.

The related document for siting the plutonium disposition facilities is the Surplus Plutonium EIS, with public scoping meetings on the document`s scope planned for June 19.

Spent Nuclear Fuel Management at the Savannah River Site

Bridges began this portion of the meeting by describing spent nuclear fuel (SNF). Terms used to describe SNF are rods, assemblies or elements. The material contains a uranium-235 isotope, clad in aluminum, zirconium or stainless steel. He provided a chart showing the quantities of the type of fuel (commercial, production and research) and where it is stored across the country. (See attached presentation).

Recently, SRS was selected by DOE to manage up to 20,000 aluminum-based fuel elements from domestic and foreign research reactors. Bridges said the fuel will be stored in RBOF and L-Reactor Disassembly Basin. Although some concerns over water quality have occurred, Bridges said some fuel has been stored in the Receiving Basin for Offsite for over 20 years without corrosion. Chance of corrosion is even less now since the water in L Basin has been upgraded to a water quality equal to RBOF.

Hollingsworth asked if boride was added to the water to prevent criticality. Jean Ridley, DOE-SR, said the rods are controlled by spacing and that there has never been a criticality event. She said there has been no need to add boride to the water.

The decision on how to treat the SNF at SRS will be determined in an environmental impact statement already in progress. Public meetings on the draft documents are planned for July or Augusta 1997. Current plans are for all of the fuel to be shipped offsite by 2035 to a repository, Bridges said. The treatments being evaluated in the EIS are (1) new packaging: direct and co-disposal; (2) new processing: melt/dilute, mechanical dilution, vitrification, electrometallurgical; (3) Conventional processing; and (4) No action. Ridley emphasized DOE considers processing as a fallback option if a fuel rod fails.

Bridges said the foreign fuel receipt program will last over a 13-year period and that SRS has the capacity to store and treat the fuels. He added the fuel will be safely and securely transported to SRS as it has in the past 20 years.

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