



SRS Citizens Advisory Board

Nuclear Materials Management Subcommittee

Meeting Summary

June 19, 1996

Aiken, S.C.

The Citizens Advisory Board (CAB) Nuclear Materials Management (NMM) Subcommittee held a meeting on Wednesday, June 19, Savannah River Site. Subcommittee members attending were Tom Costikyan, chairperson, Brendolyn Jenkins, and Ed Tant. Savannah River Site resource personnel attending included Donna Martin, WSRC, Jay Bilyeu, Department of Energy-Savannah River and deLisa Bratcher, Associate Designated Deputy Federal Officer, DOE-SR. Tom Rolka represented the South Carolina Department of Health and Environmental Control. Public attendees were Lee Poe, Bob Overman and Rod Wilcox. CAB facilitator, Walt Joseph, also attended.

The meeting, requested by Costikyan, provided an extended look at SRS's program to stabilize nuclear materials. Costikyan explained that reasoning for the June 19 meeting was to determine the next issue for the CAB NMM subcommittee involvement. Because issues of the F and H Area canyon's role in stabilizing DOE's nuclear materials had been in the public venue, he felt a presentation was necessary to provide background for the subcommittee.

SRS Stabilization Program Overview

Rick Geddes, WSRC, opened the first half of the meeting and said the audience would hear the status of SRS nuclear materials stabilization activities, why the material needed to be stabilized, and the near and long-term plans and visions on stabilization of other nuclear materials, including materials from other sites.

Geddes explained DOE is faced with two major questions (1) how do they stabilize material and (2) what will they do with the material once it is stabilized—how will it be dispositioned.

SRS's efforts to stabilize its inventory of nuclear materials was mapped through the Interim Management of Nuclear Materials (IMNM) environmental impact statement, completed in March 1995. In essence, SRS was responsible to look at its inventory of nuclear materials remaining in the production cycle when the Cold War ended, identify the material that was unstable, and ensure all the material could be safely stored for at least 10 years.

Geddes explained the majority of material was in three forms: solutions, solids and spent nuclear fuel. The material is stored in the middle of the site, primarily in F and H Areas and in K and L reactor areas. This action helps protect the public and also conforms with the CAB's future use recommendation on zoning SRS by nuclear and non-nuclear zones, Geddes added.

He then gave a general overview discussion on the H and F Canyons, including photos of the outside and inside of H canyon. In reality, he said two canyons are within a canyon building. The canyons contain chemical processing equipment that is operated remotely.

Geddes also presented a photo of a reactor building. Within the building, water-filled pools contained the spent fuel rods. The majority of the uranium feed stock is also stored in the reactor buildings.

The Receiving Basin for Offsite Fuel (RBOF) located in H Area is also a fuel storage pool. Fuel elements and assemblies, much of it from foreign research reactors, are stored in 10 feet of water. The water is very pure with a high quality chemistry as a prevention to corrosion of aluminum-clad fuel.

Geddes said there are many different types and sizes of fuel rods. He showed a model of an aluminum-clad fuel assembly. Three fourths of the incoming foreign research reactor fuel would be of the type he was using as a model, he added.

One problem with storage of aluminum-clad fuel in the water basins comes from corrosion. A photo of corroding fuel was shown. Geddes said uranium can seep out of the corroding outer covering and release highly radioactive fission products into the water.

In the years prior to the end of the Cold War (1950s through 1992) the spent fuel was stored in the cooling basins for only a short period of time before it was recycled (chemically processed) in a canyon, Geddes said. The uranium and plutonium were extracted while the high level wastes were emptied into a waste tank.

The plutonium button—a metal hockey-puck sized disk—was the product. These buttons could then be more easily stored or shipped to support defense activities. Geddes had a model of a plutonium button to show to the subcommittee.

The recycling of nuclear materials also involved scrap plutonium material. Geddes said the SRS canyons processed the scrap material of other sites as well as scraps originating at SRS. The scraps were processed to get the higher quality plutonium and make the buttons. For storage, the plutonium buttons were (1) placed in a small can, (2) the canned plutonium was placed in a plastic bag, (3) the bagged plutonium was put into another can that resembled soup cans and (4) the cans were stored in a vault.

Once SRS completed its evaluation of nuclear materials, about 2,800 cans of plutonium (buttons and scraps) were identified. The Defense Nuclear Facilities Safety Board (DNFSB)—an independent organization that monitors operations at DOE nuclear facilities—stated in a report that the 2,800 cans of plutonium were not in a form suitable for long term storage.

Geddes then described the categories of nuclear materials listed in the IMNM Environmental Impact Statement (EIS); 98% of the nuclear materials inventoried were determined stable. SRS would continue monitoring, sampling and measuring this material.

One percent of the material was included in the "Candidates for stabilization" category. Especially vulnerable material identified by the DNFSB were in this category. The other 1% of the inventory was considered programmatic, or those isotopes that have special uses. This material is in solutions form, which is not suitable for shipment and use.

Brendolyn Jenkins asked for an example of a programmatic material. Geddes said neptunium is used to make Pu-238, the material that powers deep space probes. SRS has all of the western world's supply of neptunium. Americium and curium are used by physicists to conduct high energy physics research. Geddes said SRS has most of the world's americium and curium as well (with the exception of Russia).

DNFSB 94-1 Recommendation

SRS's stabilization of materials began under the implementation of the DNFSB 94-1 Recommendation. Geddes explained that the Defense Board conducted a review and study of all DOE facilities once responsible for making materials for nuclear weapons.

Geddes then introduced John Dickenson, WSRC manager responsible for stabilization activities. Dickenson said he had worked with the canyons operations for 18 years, spanning the Cold War and post Cold War and stressed SRS has traditionally carried out safe operations. With the end of the Cold War, Dickenson said it was clear SRS had to safely store the nuclear materials no longer being used for defense purposes.

With the amount of nuclear materials remaining throughout the complex, however, DOE felt an independent review of the post Cold War situation was essential. Dickenson said in early 1994, the DNFSB went to SRS and all other DOE nuclear facilities to assess how the facilities' packaged and stored nuclear materials. The DNFSB issued a report called "Recommendation 94-1" to Secretary O'Leary citing specific vulnerabilities. Their recommendation suggested DOE correct the most significant vulnerabilities within three years and the remaining vulnerable items within 8 years.

Two SRS items were listed in the category of materials requiring near term action within three years: Plutonium solutions in F Canyon and corroding spent fuel in reactor basins. DNFSB said those issues should be addressed with three years. Other concerns included unstable plutonium residues and packaging of plutonium oxide and buttons.

Dickenson said the Site developed a stabilization plan to address both the 94-1 issues and the IMNM EIS. The plan included:

- Converting plutonium solution to metal or oxide to avoid an accidental criticality, which Dickenson pointed out can be easily avoided.
- Blending enriched uranium to low enriched (proliferation resistant)
- Processing the plutonium, reactor fuel targets
- Converting the special isotopes to oxide or glass
- Repackage buttons in newer, more sturdy SRS-designed packaging

The cans require repackaging to protect against potential corrosion and internal pressurization. Jenkins asked if the plutonium button can be converted to its original form. Dickenson said the plutonium could not be placed back into spent fuel once it was converted to the button form unless it was recycled. However, the metal button could be converted to a purer form of plutonium for storage until final disposition is determined.

Jenkins then asked if SRS takes a further step in getting the button in a non-weapons form. Dickenson said that any such action would take place under DOE's disposition program. Dickenson added DOE is very close to making a decision on final disposition of plutonium and uranium. Regardless of the method used, the purpose is to keep the nuclear materials from health/safety and proliferation risks.

Lee Poe asked if Dickenson still agreed that storing spent fuel in RBOF and in the reactor area cooling basins was acceptable for temporary storage since there was evidence of corrosion even after water chemistry was improved. Dickenson explained to the subcommittee that despite the water quality improvements to the basins, there was evidence that the plutonium targets already corroding continued to do so. To safeguard against any health or safety risks, Dickenson said the corroding targets would be processed. Those targets showing no signs of corrosion, however, could be safely stored in the basins up to 10 years. Dickenson emphasized that most persons would agree wet storage is not the proper option for long term storage beyond 10 years.

Costikyan noted that DOE implied the same judgment in its Record of Decision on the wet storage of foreign fuel. DOE stated in the Foreign Research Reactor EIS that processing could be considered if a viable technology to store the fuel is not demonstrated by 2000.

Bob Overman said there should be no way for the Environmental Protection Agency to approve the concrete tanks DOE calls basins. Overman said they are not leak proof, earthquake proof and he suspects the basins are the source of cesium contamination in the Savannah River. Poe said Overman's statement was wrong and the position was overstated significantly.

Dickenson presented a milestone chart to show how SRS intends to stabilize its materials within eight years to meet the 94-1 Recommendation. The program proposed is aggressive and Dickenson pointed out that many operational requirements were already in place before 94-1 was even implemented. As of June 1996, 17 of 43 milestones had been completed. Startup of F Canyon to stabilize the plutonium solutions was a major task. Most of the safety documentation and paperwork for restart of H Canyon is underway.

Dickenson said that the stabilization schedule included the operation of both F and H canyons. Jenkins asked if the F Canyon staff could be used to operate H-Canyon, thereby reducing costs and manpower needs. Dickenson said personnel are required for 24 hour maintenance and operation in both canyons. He did say, however, the F Canyon trainers and training program could be used for H Canyon preparation.

Costikyan asked if DOE has plans to operate both canyons. Dickenson said official guidance has never indicated a change from two canyons to only one.

Poe asked how one versus two canyons would impact the stabilization schedule. Dickenson said schedules have been charted for the operation of F Canyon and the operation of H Canyon to stabilize the materials. Dickenson said there would be a definite impact on stabilization of materials if only one canyon was used for stabilization activities.

Donna Martin asked about the potential of a lawsuit and how it would affect the schedule. Dickenson said the canyon (s) would continue operation unless directed otherwise by DOE or by court order.

Trade Studies and Stabilization of Offsite Materials Because the 94-1 Recommendation addressed materials of concern at all DOE sites, SRS is not alone in the requirement of stabilization materials. According to Geddes, Rocky Flats, Hanford and Los Alamos have been directed to take near term action on plutonium residues. The Rocky Flats Facility in Colorado has the biggest inventory of plutonium residues. That facility is closing and all material must be removed.

DOE has undertaken what it calls "trade studies". These studies are conducted to evaluate alternative technologies and sites for material stabilization activities, Geddes explained. At least three of these studies recommend that various forms of plutonium residues be shipped to SRS and processed. The studies take into consideration safety needs and cost effectiveness.

Geddes said the other sites and DOE-HQ are looking to SRS because it is the only plutonium facility in the DOE complex that is functional on a production and operational scale. Los Alamos has small scale processing facilities which could only handle the Los Alamos material.

An EIS will likely be the next step if Rocky Flats pursues sending its 94-1 plutonium residues to SRS. Geddes said the EIS would likely begin around August, although DOE has not determined where the EIS will originate—from Rocky Flats, DOE-HQ or SRS.

Poe asked what is the Site doing to diffuse the idea of SRS becoming a dumping ground. Geddes said one answer is you bring the material here to stabilize it, but not permanently store it. Rather, the material would be used to feed the disposition program. The disposition decision should be made by the end of 1996, Geddes added.

Jenkins questioned about the necessity of another set of paperwork if DOE determines to send the material to SRS. Dickenson said from a stabilization point of view, some of the Rocky Flats material was already at SRS from previous years and the process, procedures and paperwork were in place to stabilize it. Stabilizing more material should not require additional preparation. The main question is providing enough storage for the stabilized products.

Overman said he noticed DOE has given the Medical University of South Carolina a grant to allay fears of South Carolina as a dumping ground. He asked if the CAB could give any feedback to the public.

Costikyan said education was a dimension of the CAB's responsibilities, which he felt was one of the most important tasks to be done. Fears of the public and the governor of South Carolina could be tempered through education on storage and stabilization of nuclear materials.

Jenkins asked how the CAB could alleviate the reputation of SRS being thought of as a dumping ground. Costikyan responded and asked why would SRS not assist in the national interest.

To put the stabilization issues in perspective, Geddes said SRS could take thousands of plutonium-filled residue containers, process them to a few hundred metal buttons, put them in newly designed packages and store the containers in a vault.

Jenkins asked if there was a way to prevent the plutonium buttons from being used. Geddes said security measures and the disposition of the material would make it proliferation resistant.

Walt Joseph questioned if the trade studies had been published and if the subcommittee would have access to the studies. Geddes said the trade studies have not been released for the public, but if DOE decides to initiate an EIS, NEPA activities would be a way for the subcommittee to participate. He added the EIS would deal with radiation, risk and waste generation of the stabilization activities.

Poe said the storage situation could be diffused if DOE would make a decision on disposition. He felt the disposition issue was the primary issue with Governor Beasley and politicians in other parts of the state who do not in support of SRS. Poe added the CAB NMM subcommittee should tell DOE that SRS should not store all of the nuclear materials located in the US.

Costikyan said he can't understand why politicians view stabilization of materials from other sites as an environmental hazard instead of an economic benefit. Poe said the politicians do not want any material until the final disposition issue is settled. He added, however, that competition from other sites for the stabilization and disposition preparation activities is building up.

Costikyan then discussed a conversation he had with a newly elected official in the Beaufort area. She had read and agreed with Costikyan's recent column about the subcommittee's work and recommendations and that many of the public fears were unwarranted.

Much discussion centered on the politics of South Carolina being thought of as a dumping ground and how to educate and bridge the concerns of people in the other parts of the state. Overman stated the primary "dumping ground" issue began with the low-level waste facility in Barnwell.

Ed Tant said educating people about the issue would help their understanding and be a good way to diffuse the issue. Jenkins suggested developing a paper showing the pros and cons of SRS assisting with other stabilization activities would be a good way to logically approach the public.

Disposition of Nuclear Materials and the Role of the Canyons Geddes began the last segment of the meeting which addressed disposition and the role of the canyons. He stated that two documents—None on non-proliferation and the other a technical summary report—point toward

SRS as the facility of choice for disposition activities. Low environmental impacts and low costs all led to the F Canyon at SRS. He added that a defense mission of pit fabrication is being considered at SRS.

DOE is also very near to a decision on the disposition of surplus highly enriched uranium, Geddes said. SRS has been identified as having the most capability in the U.S. (using H Canyon) for the blend-down of highly enriched uranium to low enriched uranium.

And finally, with the foreign fuel coming to SRS, Geddes said DOE is faced with stabilizing the material. As pointed out earlier, DOE will turn to processing to stabilize spent fuel unless a better technology is determined before 2000.

In final discussion, Costikyan queried the subcommittee and public on the most logical issue and time frame for the subcommittee's attention. He said the use of the canyons in stabilization and disposition activities appeared to be prominent in all issues.

Dickenson suggested the subcommittee take bite-size pieces and go through a logic flowÑ(a) Is the current plan suitable if both canyons run? (b) What is the effect of one versus two canyons? (c) Could SRS assist other sites if only one canyon is operated? (d) What are DOE's intentions if material is stabilized at SRS?

Joseph suggested the subcommittee start with the canyon seismic studies, hear a presentation and form an opinion on whether the study was a valid, impartial evaluation.

Poe agreed that the CAB could form a position statement on the seismic study while preparing to work on the one versus two canyons. Study of the canyon should include end of life considerations, costs and schedules. He also felt the CAB should make a statement on the stabilization program.

In addition, Poe recommended the subcommittee stay abreast of the political situation by diffusing fears and even visiting the governor.

Costikyan said his first choice would be to address the issue of one versus two canyons. Geddes added it would be difficult to evaluate one versus two canyon without first developing a position regarding future programs.

The NMM subcommittee decided first to hear a presentation on the seismic study conducted on the canyons. The meeting was tentatively set for July 10 at 1 p.m. Location would be determined at a later date. After hearing the presentation, the subcommittee will form an opinion on the degree of impartial, valid and technically sound evaluation of the study and present a position statement at the full CAB meeting on July 23.

Costikyan ended the meeting and said the NMM subcommittee would graduate to the more complex stabilization and canyon issues over the next six months.

Note: Meeting handouts may be obtained by calling the SRS CAB toll free number at 1-800-249-8155.