



## **SRS Citizens Advisory Board**

Nuclear Materials Management Subcommittee

### **Meeting Record**

**May 18, 1998**

**Savannah DeSoto Hilton in Savannah, GA**

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The Citizens Advisory Board (CAB) Nuclear Materials Management (NMM) Subcommittee met Monday, May 18, 1 - 4 p.m. and 7 - 8 p.m. at the DeSoto Hilton, Savannah, GA. Subcommittee Chair Tom Costikyan presided at both meetings.

Board members present at the 1 - 4 p.m. meeting included Jimmy Mackey, Ed Tant, Mary Elfner, Wade Waters, Becky Gaston-Witter, Barbara Murphy, Arthur Belge and Karen Patterson. Department of Energy Savannah River (DOE-SR) representatives were Gerri Flemming Associate Deputy Designated Federal Official for DOE, George Klipa, DOE-Material and Facility Stabilization (MSF), invited speaker, and Becky Craft, DOE Office of External Affairs. Donna Martin attended from Westinghouse Savannah River Company. Public attendees were Zeke Williamson and news reporters from Savannah television station WTOC . Tim Mettler attended from South Carolina Department of Health and Environmental Control.

Attendees at the 7 - 8 p.m. meeting were Jimmy Mackey, Ed Tant, Ken Goad, and Mary Elfner. DOE-SR representatives were Charlie Anderson, Director, Reactors and Spent Fuel Division, invited speaker, and Gary Little, Associate Deputy Designated Federal Official for DOE. Donna Martin attended from Westinghouse Savannah River Company.

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### **AFTERNOON MEETING: 1 - 4 p.m.**

#### **PROCESSING NEEDS ASSESSMENT STUDY**

##### **Introduction**

Tom Costikyan introduced George Klipa, DOE-SR Materials and Facility Stabilization, as the afternoon speaker. Klipa said he has been involved in a Processing Needs Assessment Study conducted complex-wide to identify if any additional nuclear materials may require the Savannah River Site canyon facilities for stabilization or disposition prior to canyon decommissioning.

Klipa explained the study branched from the Phased Canyon Strategy approved by Secretary Pena in July 1997. Within the strategy, DOE identified materials that are firm, proposed and potential missions for the canyons. The Phased Canyon Strategy specifies the following:

***Firm Missions***

- All Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-1 materials and Taiwan Research Reactor Fuel

***Proposed Missions***

- Spent Nuclear Fuel (SNF) that is difficult to dispose of using technologies other than reprocessing and certain Rocky Flats residues

***Potential Missions***

- Backup for nuclear material stabilization activities, aluminum-based SNF, and fissile materials disposition

Klipa said SRS is currently stabilizing the 94-1 materials in the canyons. The canyon strategy would involve extending F Purex operations to fiscal year 2000, F-Area operations to fiscal year 2002 and H Area operations to fiscal year 2004.

The Processing Needs Assessment study was started in September 1997. Personnel from all DOE sites were pulled together as a team. The team then sent out a data call to the DOE sites to try and identify what materials were being stored and how the sites intended to stabilize and dispose of the materials.

According to Klipa, the team subdivided into several material working groups and went through an approach to screen out material they knew would not be suitable for the canyons. The nuclear materials screened in were ranked with a technical maturity process that included requirements, process, hardware, facility, operational safety, personnel, schedule and NEPA readiness. Scores ranged from 0 (implemented) to 10 (not proven).

After the screened materials were ranked, they were identified according to high, medium and low potential for being stabilized through the canyons.

- High Potential      Proposed for processing consideration
- Medium Potential    Potential sufficient to warrant backup
- Low Potential       Monitor until the current plan is demonstrated

Klipa emphasized that the Needs Assessment study was strictly a technical study, similar to DOE trade studies but addressing more materials.

**Study Conclusions**

### ***High Potential Category***

Materials in the high potential category (proposed for processing consideration) included single pass reactor fuel at Hanford and miscellaneous damaged fuels throughout the complex.

Plutonium at Rocky Flats (classified metal parts), Hanford (Pu Alloys/Compounds) and SRS (unirradiated plutonium tubes) also were included in the high potential category. Special isotopes (miscellaneous targets) were the final set of materials identified as being a high potential candidate for processing.

Klipa said if the materials were processed through the canyons, the H canyon schedule could be extended by one or two years and F Canyon operations would be extended by a little less than one year. Specifically, Klipa said three metric tons of single pass reactor SNF at Hanford, which is similar to SRS material that is currently being processed, could also be processed through the canyons in a 3-6 month campaign.

About 13 kilograms of plutonium at Hanford are proposed for processing in the canyon because the plutonium concentration is too high to be shipped to the Waste Isolation Pilot Plant. Klipa said the Hanford plutonium could be processed in less than three months.

The unirradiated plutonium tubes at SRS are proposed for processing through the canyons because the current aluminum content makes the material unsuitable for transfer to the DOE Material Disposition (MD) program. The tubes could be processed, however, and between 40 and 50 kilograms of the plutonium would then be suitable for disposition by the MD program.

The miscellaneous targets at SRS consisting of special isotopes is another category of materials identified in the Needs Assessment for processing in the canyons. Klipa said the 65 targets are being stored in the Receiving Basin for Offsite Fuel. The americium/curium could be shipped to Oak Ridge for programmatic purposes. Klipa added that a feasibility study would have to be conducted first before the material is processed.

Jimmy Mackey asked about the cost of the feasibility study. Klipa said a feasibility study could cost several hundred thousand dollars and that money is already allocated to conduct the study.

Karen Patterson said DOE simply should make a decision and begin work rather than continuing with study after study.

Klipa explained that in all the cases for suggesting processing, there either was not a good plan or no plan at all to stabilize the material. Klipa said another situation facing DOE is that the organization is still not sure what the waste acceptance criteria will be when and if Yucca Mountain opens. For example, Klipa said the application for license will take two years, construction will take four or more years, plus vulnerability studies and environmental impact statements must be completed before the repository can open.

Although DOE is hoping some of its spent nuclear fuel can be directly disposed in the repository or co-disposed with a melt and dilute process, there is a great chance much of the fuel, including the 2100 metric tons of N Reactor fuel at Hanford, cannot be directly disposed in the repository.

If DOE is forced to process the fuel, Klipa estimated the cost to be several hundred million dollars and an extension of canyon operations for multiple years.

Patterson asked what would happen if Yucca Mountain does not open; for example, would DOE need to construct and operate canyon type facilities at its many sites.

Klipa explained that some plutonium is destined for the MD program and for WIPP. However a more integrated approach is needed throughout DOE, he said. The purpose of the Needs Assessment was to identify all radioactive material not already certified as waste. Some of the materials are surplus and others will be declared surplus in the future.. One of the situations Klipa mentioned earlier was the fact there are no disposition plans for many of the materials.

Mary Elfner and Jimmy Mackey asked Klipa if he felt SRS was taking on most of the burden of materials for short term storage or processing.

Klipa explained that the canyons have unique capabilities to stabilize material in a large-scale effort. Hanford and Idaho also had processing capabilities in the past, although all are now shut down. A few small-, laboratory-scale capabilities exist in the complex (at Los Alamos for example), but they cannot process large quantities of material. As a result, the Needs Assessment study was developed to help DOE stabilize materials that have no disposition path other than processing in the canyons before they are shut down. It is also important to understand what will happen with the remaining materials once the canyons are shut down, he added.

Elfner then asked if there were percentages available on the amount of waste and nuclear materials destined for each site. Donna Martin, WSRC, said the League of Women Voters will try to identify those percentages in public workshops to be held over the summer.

Questions on new missions at SRS also were asked. Klipa said SRS is actively seeking missions dealing with surplus plutonium and offspec uranium. He explained that currently, the largest quantity of excess plutonium (about 33 metric tons) identified for mixed oxide is in the form of pure metals and oxides and pits while only 17 tons of plutonium will be immobilized. Klipa said SRS is currently being considered as the preferred alternative for immobilization in the Surplus Plutonium draft EIS.

### ***Medium Potential Category***

Klipa prefaced this portion of the presentation by explaining that material screened in the medium potential category (potential sufficient to warrant backup), basically means that materials may require some type of processing capability (but not necessarily a canyon) beyond 2004.

One set of materials included in the medium category, N Reactor fuels at Hanford, consists of 2100 metric tons and would extend the canyon operations substantially. Klipa emphasized again that the team is not recommending the material come to SRS, but rather, stabilizing the N reactor fuel at SRS should be explored.

Costikyan asked why the N reactor fuel is a candidate for the canyons. Klipa said the fuel is similar to SRS fuel but it is clad with zirconium, not aluminum. Uranium metal is pyrophoric and may not be suitable for direct disposal to the geologic repository. Klipa added, however, changes would have to be made to the canyons because they currently are not equipped to dissolve zirconium. Klipa said Hanford's disposition plan for the fuel is to move it to dry storage then direct disposal in the repository. He pointed out, however, that there is a high degree of uncertainty in the possibility of direct disposal.

A question was asked if it was necessary to store spent fuel in water before placing it in dry storage. Klipa said fuel can be placed directly into dry storage. The spent fuel will corrode if it stays in wet storage with poor water quality. Fuel in wet storage with good water quality has been stored for almost 30 years with no significant corrosion.

Other materials possibly requiring a processing capability beyond 2004 are classified shapes at Rocky Flats. The FB-Line, not the canyon, would be used to conduct the work. This activity would likely take about two years, Klipa said.

Arthur Belge, CAB, questioned Rocky Flat's inability to store and handle classified material. Klipa said the issue was not stabilization, but a classification and cost issue. The team determined that the costs to stabilize the material in the canyons was much lower than to continue storing the material for 10 years with safeguards.

## **Conclusions**

Costikyan asked if it was correct to assume that the canyons are too expensive to keep operational for "odds and ends." Klipa confirmed his statement. Patterson questioned if the results from the Nonproliferation Study would impact conclusions in the Needs Assessment Study. Klipa said he did not know but was sure the canyons would continue operating to stabilize 94-1 nuclear materials at SRS.

Costikyan also stated that his impression of the Needs Assessment study was that DOE identified the nuclear materials that seemed to cry for canyon processing. Klipa said the study was conducted to provide senior DOE management a purely technical review of the inventory of nuclear materials potentially requiring stabilization.

Klipa said the study concludes that material in the medium category needed more attention on disposition paths and the canyons could be an option. Results may prove canyon processing as the most inexpensive way to stabilize the material, he added.

Mackey asked how political aspects will be factored into decisions. Klipa said management will make decisions based on cost, technical suitability and policy; the Needs Assessment study provides the technical basis for decisions.

Costikyan referenced slide eight of the presentation (materials in medium category requiring some form of processing after 2004) and asked if DOE was confident with work conducted on alternative technologies. Klipa confirmed that DOE will focus on alternative technologies such

as melt and dilute for spent nuclear fuel; however, for any technology to be proven, a technology demonstration is necessary. Klipa said DOE is aware many technology demonstrations will not even be possible until 2002-2003.

## **NUCLEAR MATERIAL MANAGEMENT INTEGRATION PLAN**

### **Introduction**

A new project underway by DOE is called the Nuclear Material Integration (NMI) plan. According to Klipa, this project evolved from a DOE task group developed to respond to Defense Nuclear Facilities Safety Board (DNFSB) recommendations and was expanded to address stewardship of nuclear materials throughout the DOE complex.

The stewardship team consists of personnel from DOE-HQ, DOE-Savannah River and DOE-Albuquerque. The project will be conducted in three phases, with the first phase focused on defining excess nuclear material inventories and disposition baselines. Klipa said the first phase of the project should be completed in September.

Klipa said the team will attempt to identify the total inventory of nuclear materials to define baselines. They will begin with information already compiled for the Processing Needs Assessment study.

One of the most difficult situations the team faces is identifying materials such as cobalt, cesium and strontium which are not tracked by an official system but will eventually be excess and dispositioned.

The NMI is being conducted to assist DOE-Environmental Management with closing sites. To accomplish closure of sites, (Rocky Flats for example), DOE must move and consolidate the material at other DOE sites. Before Rocky Flats can be closed (target date of 2006), 12 metric tons of material must be removed. The Mound facility is another DOE site identified for early closure. Klipa said Mound has a variety of unique materials that must be removed.

Klipa added that many materials are ideally suited for activities involving cancer research or other medical purposes. The NMI task team must try and identify the disposition path of such material.

The longer-lived isotopes are more difficult to manage, Klipa said. For example, DOE has 500,000 metric tons of depleted uranium hexafluoride. The issue is not stabilization, but rather disposition. The material cannot be sent to a low-level waste facility. Although stable, DOE does not have a disposition path for it.

The NMI team is currently working to identify materials "owned" by EM, materials "owned" by other programs but housed in EM facilities or sites, and materials expected to transfer to EM ownership or control by 2015.

The material scope is divided into three categories:

- Trans-Uranic Isotopes: neptunium, plutonium, americium, curium, berkelium, and californium
- Uranium/Thorium: Highly enriched uranium, low-enriched uranium, natural and depleted uranium, uranium-233, and thorium
- Non-actinide Isotopes and Sealed Sources: Other nuclear materials, including sources, standards and research materials such as cobalt, cesium, strontium, actinium and protactinium.

Klipa emphasized the team must work more closely with DOE Defense Programs and Material Disposition to identify national asset items and do a better job of identifying risks. Disposition plans identified in the NMI must also be more strongly linked to other plans such as the Accelerated Cleanup Plan: Pathways to Closure (ACP).

For Phases II and III, technical trade studies will be conducted for specific materials, then disposition maps will be developed and included in the ACP. NEPA will also be conducted as appropriate.

Costikyan said it appears DOE-HQ is trying to identify the most efficient way to disposition materials throughout the complex. He questioned if the consolidation of materials would interfere with equity issues. Klipa said DOE must have a technical basis for any plan and the NMI will provide the baseline.

Mackey asked Klipa to state what he thinks is the biggest challenge in developing the NMI. Klipa said identifying the materials is the most challenging aspect. Scoring technologies objectively is the other difficult task, leaving DOE at the most risk of criticism. Klipa said when a technology is rated for a particular material type, the sites who own the material will be asked to participate in the ranking as well personnel from other sites.

Costikyan said he hoped waste and nuclear material issues will be optimized and not affected by equity or transportation issues. Concerning equity, Costikyan said it would seem appropriate for taxpayers to support consolidation of materials to free up funding to close DOE sites.

Klipa said there were fewer unknowns in safely transporting material as opposed to coordinating the transportation vehicles and canisters once DOE begins transporting more materials. Transportation will tie DOE's consolidation effort together, Klipa added.

Klipa concluded the meeting by reemphasizing NMI will be conducted in phases, with Phase I to be complete in September 1998 and Phase II in September 1999. Phase III will be determined at a later date.

## **K AREA MATERIAL STORAGE SUB-PROJECT**

### **Introduction**

Costikyan introduced Charlie Anderson, Director, DOE-SR Reactors and Spent Fuel Division, to discuss a proposal to store plutonium oxides and metals in K-Area buildings.

Anderson said upfront he would like to de-emphasize the reactor aspect of material storage in K Area. First he said that none of the reactors at SRS were operating. Second, Anderson said the proposal being considered does not include storage of any materials in the reactor vessel area. Instead the proposal recommends the material to be stored in the process room, crane maintenance and stack area.

Anderson explained the purpose to upgrade 105-K building is to assist with DOE's effort to close Rocky Flats by 2006. DOE made a decision in 1996 in the Storage and Disposition of Weapons-Usable Fissile Materials Record of Decision to send 2,800 drums of Rocky Flats plutonium metals and oxides to Savannah River by 2010.

In the original decision, DOE would store the material in the to-be-constructed Actinide Packing and Storage Facility (APSF). To help DOE reach a new goal of closing Rocky Flats by 2006, however, SRS developed the proposal to upgrade the 105-K building to allow early shipment of Rocky Flats metals and oxides, saving DOE about 1.35 billion in Rocky Flats operating costs.

Anderson added that the need to upgrade 105-K, rather than waiting until the APSF was constructed results from the need to begin shipping the material from Rocky Flats in 2000. The APSF will not be completed until late 2001.

Ken Goad, CAB NMM vice-chair, asked why K Reactor was chosen. Anderson explained K Reactor was selected for the project because the facility had the best seismic qualifications, an available security system and support systems due to upgrades during the reactor restart in 1991.

Questions were asked about the possibility of the United States needing to start up a reactor to produce tritium. Anderson said it would be extremely unlikely that an SRS reactor be restarted. He pointed out that DOE does have sources to recycle or reclaim tritium such as SRS's Replacement Tritium Facility (RTF). Anderson explained the material would be shipped to SRS in drums and stored in the process room, crane maintenance and stack area. In preparation for storage, the areas will be cleared of unnecessary structures, decontaminated and converted to a material access area (security vault).

Costikyan asked if the shipping vessels were certified shipping containers. Anderson confirmed that all are Department of Transportation certified containers. At the 105-K Building, the containers will be stored four or five to a pallet and two pallets high.

Elfner asked if there were different types of shipping containers for various materials. Anderson said the two containers used for metal and oxide shipments have a primary container holding the

plutonium within a sealed secondary container. The container called a "9975" has lead shielding. Anderson added metals and oxides have been shipped from Rocky Flats to SRS since the 1950s in the same type of containers.

Concerning storage of the plutonium, Anderson said several other materials have been safely stored in K Area in 55-gallon containers, including highly enriched uranium and heavy water.

### **Project Costs**

If the proposal is accepted, it will be completed in three phases in 1998, 1999 and 2000. The \$50 million required will be divided in the following ways:

- \$21 million for upgrades to 105-K
- \$20 million for drums
- \$9 million for operational support

Before any upgrades can begin, DOE must complete two documents: a NEPA Supplement Analysis which looks at impacts from storing the plutonium in 105-K instead of APSF. Anderson said the draft SA would be released on June 1, 1998.

The second document required is a Vulnerability Assessment required to evaluate the security posture of the facility.

Elfner asked if the material would be moved from K Area to APSF when that facility is completed. Anderson said he did not know if the material would be moved. He did say materials requiring additional stabilization would be sent to F Area.

Mackey asked if other sites were assisting with the costs of upgrades and shipping. Anderson said additional money will be provided by DOE-HQ if the project is accepted.

Costikyan said the project, if accomplished, would be a great demonstration of the integration of nuclear materials. Costikyan added the success of such a project would possibly warrant an endorsement by the CAB, particularly since it was a concept the public could grasp.

Because of Costikyan's interest in DOE initiating similar projects, Anderson provided a chart showing the SRS reactors, their current status and storage potentials. He said alternate treatment for spent fuel is planned for L Area. As a result, wet storage will be discontinued and L Basin and the Receiving Basin for Offsite Fuels will be shutdown for cost savings. C and R Reactors are in surveillance and maintenance modes with decontamination and decommissioning planned in the future.

Anderson said the heavy water stored in L Area will likely be sold to commercial reactors (Canada reactors for example). Mackey asked if SRS would receive money from sales. Anderson said money would go into all DOE activities, including SRS.

In conclusion, Anderson provided the following schedule for the K Area Material Storage project:

May 18, 1998:	Issue Conceptual Design
June 1, 1998	Begin Detailed Design
September 1, 1998	Publish Amended Storage and Disposition Record of Decision
October 1, 1999	Complete Phase I construction
January 1, 2000	Ready to receive materials

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