



SRS Citizens Advisory Board

Nuclear Materials Management Subcommittee

Meeting Record

November 17, 1997

First Baptist Church, Barnwell, SC

The Citizens Advisory Board (CAB) Nuclear Materials Management (NMM) Subcommittee held a meeting on Monday, November 17, 5 p.m. at the First Baptist Church in Barnwell, S.C. Subcommittee members attending were Tom Costikyan, NMM chair, Mary Elfner, Jimmy Mackey, and Brendolyn Jenkins. Savannah River Site resource personnel attending included Donna Martin, Westinghouse Savannah River Company, and Karen Poore, Associate Designated Deputy Federal Officer, Department of Energy-Savannah River. Attending speakers were Arnold Guevara, DOE-HQ, Bob Kenley, Lockheed Martin Idaho Technologies, and Karl Waltzer and George Klipa, DOE-SR.

MEETING OVERVIEW AND SUBCOMMITTEE STATUS

Costikyan opened the meeting with a summary and status of studies and activities that are underway to evaluate different aspects of DOE's program to stabilize, manage and dispose of nuclear materials remaining from the Cold War. In summary, Costikyan highlighted the following studies to be researched by the subcommittee over the next year:

Rocky Flats Plutonium Residue and Scrub Alloy EIS

Costikyan said the long awaited draft document was released to the public on November 14. The public comment period will last through January 5, 1998 with a public meeting scheduled for Tuesday, December 16, 6 p.m., Ramada Plaza, downtown Augusta. Costikyan said since the subcommittee will not have an opportunity to develop a recommendation until the January meeting in Hilton Head, the CAB will send a letter to DOE-HQ requesting that they accept a recommendation beyond the close of the comment period.

Surplus Plutonium EIS

The draft EIS to identify where to conduct mixed oxide and immobilization activities for surplus plutonium is scheduled to be issued in early 1998, Costikyan said. He then referred to the recommendation adopted by the CAB in 1996 on the disposition of surplus materials. Costikyan said he expects the subcommittee to develop a recommendation on this draft EIS.

Nonproliferation Study

Costikyan pointed out that the CAB has yet to receive a reply from DOE-HQ on the status of the draft report, which was originally expected for release by fall 1997. Results of the nonproliferation report will play into decisions to be made on how to store and dispose of spent nuclear fuel at SRS, he added, and the draft will likely be released in March 1998 when the draft Savannah River Site Spent Nuclear Fuel EIS (SRS SNF EIS) will be released.

SRS SNF EIS

The draft SRS SNF EIS will evaluate technologies being considered to stabilize spent nuclear fuel at SRS, including chemical processing. Affiliated with this EIS is an independent study being conducted by the National Academy of Sciences (NAS) National Research Council which will provide an unbiased look at DOE's efforts to identify alternative treatment technologies. Costikyan said the first presentation of the evening would include a discussion of the NAS study and how it will be used by DOE to make SNF decisions.

Nuclear Materials Processing Needs Assessment Study

A DOE study called the Nuclear Materials Processing Needs Assessment (Needs Assessment) was started in September, Costikyan said. One of the more significant DOE studies, Costikyan said the study will feed into ultimate decisions on the future operations of SRS canyons. Costikyan said DOE appears to be more open-minded at considering the use of the canyons to stabilize nuclear materials. He added that Arnold Guevara will provide more information on the Needs Assessment later in the meeting.

Yucca Mountain EIS

Costikyan pointed out that the release of the draft EIS on the geologic repository is a year or more away. He did say an upcoming meeting by the Nuclear Waste Technical Review Board, a committee appointed by President Clinton to evaluate geologic repository activities, will be held on December 17 at the Radisson Riverfront Hotel, 8:30 a.m. - 5 p.m. with a tour of Savannah River Site on December 18. Costikyan emphasized the meeting is open to the public and the committee members will hear presentations from SRS personnel on spent nuclear fuel and the Defense Waste Processing Facility process.

NATIONAL ACADEMY OF SCIENCES NATIONAL RESEARCH COUNCIL STUDY UPDATE

Karl Waltzer, DOE-SR, briefly explained to the subcommittee about a report just underway by the National Research Council (NRC) to evaluate DOE-SR's process to select SNF treatment technologies.

Waltzer said DOE-SR requested that the NRC conduct the study so that SRS would have an independent and unbiased evaluation to use as reference when the DOE makes its decisions on how to stabilize the SNF.

The NRC is the operating arm of the National Academy of Sciences, Waltzer explained, adding that the specific NRC section responsible for developing the study is the Board on Radioactive Waste Management. Kevin Crowley is the NRC staff lead and Milt Levenson is the principal investigator.

Waltzer said the NRC will look specifically at (1) how the technologies were selected, (2) what DOE is doing to meet repository waste acceptance criteria, (3) costs and schedules of the technologies, i.e., is DOE looking at all technical implications and are the costs and schedules reasonable, and (4) the steps DOE is taking to conduct a license amendment process.

The process to develop the report includes the principle investigator who will write the report and 10 to 15 consultants. After the report is prepared, it will be distributed to a review panel comprised of members from the National Academy of Sciences.

After comments in the first review are addressed, the report then goes back out to the review committee. Once the review committee approves the report, it then becomes an official NAS report.

Waltzer emphasized that DOE does not see the report until it is released. With the exception of providing technical information upfront, DOE does not participate in the review process. NAS expects to complete the report in March 1998.

The NRC also gathers as much technical information in a public forum as possible, Waltzer added. The next information gathering meeting set for Tuesday and Wednesday, December 2 and 3 at the Radisson Riverfront Hotel in Augusta. The meeting is open to the public.

Costikyan asked if the report would impact the treatment technology DOE chooses. Waltzer said the study could have an impact but more importantly, an independent study of DOE efforts would give the final decisions more credibility. Costikyan added that the NAS review is probably one of the finest examples of peer review.

NUCLEAR MATERIALS PROCESSING NEEDS ASSESSMENT STUDY UPDATE (NEEDS ASSESSMENT)

Introduction

Arnold Guevara, DOE-HQ, opened the Needs Assessment presentation by stating that the study is only a portion of DOE's overall effort to determine the best disposition paths for nuclear materials across the DOE complex.

DOE's ultimate decisions will occur only after three phases are completed, Guevara explained. In phase one, DOE must gather all technical facts and identify all nuclear materials. To do this, DOE-HQ is enlisting the material experts at each major DOE facility and national laboratory. Guevara emphasized that DOE is just in the first phase, with the Needs Assessment study as the primary component.

Phase two involves providing presentations and reports to top DOE management on the technical findings. After reviewing technical conclusions, DOE management then must overlay national and DOE policy and program objectives before coming to a conclusion.

And in phase three, the final pieces necessary to make a decision are to identify environmental impacts of moving material from one site to another and of treating the material. This will be done through an environmental impact statement.

Study Purpose, Background and Organization

Guevara said the Needs Assessment results will determine if any additional materials may require the SRS canyon facilities for stabilization or disposition prior to canyon decommissioning. The results of the study will feed into the canyon utilization strategy that was approved by Department of Energy Secretary Federico Pena in July 1997.

To ensure the canyon strategy is complete when presented to Congress in 1998, Pena then instructed that DOE take one last complex-wide look at nuclear materials to identify if disposition paths will or will not include the canyons as a primary technology or a backup. This effort began in August 1997 with the Nuclear Materials Stabilization Task Group (DOE-HQ, EM-66) as the lead and a completion date of December 1997.

Guevara explained the Needs Assessment team consists of multi-site representation. The group consists of four subteams (plutonium, uranium, spent nuclear fuel and small site holdings/special isotopes). Guevara said stakeholders from Energy Research Foundation, Nuclear Control Institute and the SRS CAB were invited to participate in the meetings.

Although there were strong efforts to have the stakeholders completely involved in the study process, Guevara said there were classification issues preventing the stakeholders from participating more effectively. Guevara said that the goal of having stakeholders participate is for them to understand the process and issues rather than having them endorse the recommendations.

Mary Elfner, CAB, asked for Guevara to describe the special isotope/small site holdings category. Guevara explained that those materials are small quantities or pieces of materials (such as spent nuclear fuel) used for research by laboratories. In most cases, laboratories do not have the capability to stabilize the material. Some of the material may also be peculiar blends and require different handling methods, Guevara added.

Concerning classification issues for stakeholders, Jimmy Mackey, CAB, said he would expect there to be problems. He added, however, that stakeholder participants without clearances cannot have impact during the study because they are only seeing the outside edge of information.

Guevara said his managers have challenged him to work through and open up the process so that stakeholders can participate more effectively. As one solution, Guevara said an accelerated clearance is being offered to the three stakeholder representatives who attended or were invited to attend past meetings.

Mackey suggested that DOE consider people who currently have or have had security clearances. Guevara said DOE is committed to pushing the envelope to allow security clearances and to declassify information. Unfortunately, he said, such actions may be too late for the Needs Assessment study but DOE will continue the effort for the many remaining activities. Costikyan pointed out, however, the public should accept that some classified material will not be accessible for public review.

Study Approach and Process

DOE is using an approach called systems engineering to evaluate the maturity of the technologies various sites are identifying as disposition paths for materials, Guevara explained. This approach allows the team to compare the technologies equally using the same criteria.

Most of the time and resources to date have been focused on identifying the nuclear material inventories. At present, disposition paths for some of the materials simply do not exist, Guevara said. It is the team's responsibility to keep an open mind to all existing capabilities in the complex to stabilize and disposition such material.

Costikyan said DOE should consider economics as a key parameter of future decisions in light of the continuing budget cuts. Guevara said the team is relying on the technical maturity analysis as its major tool in identifying stabilization technologies. For example, technical readiness may be different at each site and DOE must consider the probability of success. Guevara emphasized that facts based on science will dictate the study. Mackey cautioned Guevara to be careful of national security and nonproliferation efforts as well as the potential for various sites and programs competing for resources.

By the end of the study, Guevarra said, the team will have identified three sets of materials

- Materials that should not go to the canyons
- Materials that should go to the canyons, i.e. no other disposition approaches have been demonstrated or satisfactorily researched. (Example: 100 kilograms of Pu-238 should not be dealt with in a glovebox situation with possible human exposure. Rather, it should be handled in a shielded facility).
- Materials that require further analysis

Guevara said the materials requiring further analysis is the largest set. The assessment will show current site baselines versus other approaches not considered by that site.

Elfner questioned if canyon capabilities existed only at SRS. Guevara said the canyons have unique capabilities available only at SRS although some of the other sites do have small glovebox type operations that are the size of a small room.

Brendolyn Jenkins, CAB, asked if anyone in the private sector has the capability to process. Guevara said no one else in the country is licensed to process plutonium although a few facilities do commercially process uranium. She also asked if other countries had processing capabilities and if so, were they also participants in the international nonproliferation treaty. Several people

responded that a few other countries do in fact have processing capabilities. Donna Martin said she would research the issue and provide information to the subcommittee.

Concerning public involvement in the Needs Assessment, Guevara said a two-tiered approach was developed. A few interested stakeholders, including Ken Goad from the SRS CAB, had been invited to attend and observe the group meetings. In addition, informational updates and briefings will be offered to interested local and national groups and to site-specific advisory boards.

Mackey asked if there were any international concerns and how would other countries react if the U.S. were to reprocess. Guevara said DOE management is wrestling with those issues and is very aware that in the second phase of completing the canyon strategy, the teams must interact with organizations directly affiliated with the international nonproliferation treaty. The most important aspect of the Needs Assessment, he added, was to be impartial and focus specifically on the technical analyses.

Study Status

In conclusion, Guevara said the plutonium and uranium subgroups have completed preliminary screening of materials and disposition paths. The spent nuclear fuel subgroup is currently conducting screening and of the 15 material categories, six of those ³could² go to the canyons and will require further evaluation.

The Hanford nuclear production zirconium-clad spent nuclear fuel is one example. It is 90% by weight of all DOE fuel and it poses some real roadblocks, he said. Hanford plans to dry store the fuel then directly dispose of it in the geologic repository. However, there is only a 50% chance the fuel will meet waste acceptance criteria and if not, reprocessing may be the only backup, he added.

Brendolyn Jenkins asked why would DOE transfer the material to SRS then back to Nevada. Guevara explained that DOE has greater certainty that reprocessed material will meet waste acceptance criteria for the repository than the zirconium-clad fuel.

George Klipa, DOE-SR, added that the Hanford fuel is a dual purpose fuel with a cladding that ignites in normal room temperature. Historically, the fuel was reprocessed at a facility in Hanford. Klipa pointed out that if the material is identified to be processed in the canyon, it would be necessary to make some front-end modifications to the canyons because unlike the aluminum fuel, zirconium cannot be dissolved in the current canyon process.

Jenkins then asked if the geologic repository waste acceptance criteria has been established and why DOE has greater assurance that processed material would meet waste acceptance criteria. Klipa said when spent fuel is processed, the uranium and plutonium are separated out and the highly radioactive fission products go to the Defense Waste Processing Facility to be vitrified in glass. The separated uranium and plutonium will then be placed in DOE's surplus nuclear material management program. In addition, processing the material better prepares it for ultimate

disposal because a different set of criteria will have to be determined for direct disposal, Guevara said.

In conclusion, Guevara said the study will feed into a more detailed Environmental Management Integration (EMI) effort to identify the disposition paths of all nuclear materials. This effort will be similar but more intense than the EMI study developed for all DOE waste streams but will focus on all waste streams.

SYSTEMS ENGINEERING APPROACH TO TECHNICAL MATURITY OF STABILIZATION TECHNOLOGIES

Bob Kenley, Lockheed Martin Idaho Technologies, said he was invited to give a presentation on the systems engineering approach for the Needs Assessment at the request of Ken Goad, CAB member who participated during the September meeting of the Needs Assessment. After Goad heard the technical maturity approach presentation, he thought the CAB NMM subcommittee would benefit from hearing about the process, Kenley added.

DOE began using a version of the systems engineering approach in 1994 in response to a need to address nuclear material vulnerabilities identified by the Defense Nuclear Facilities Safety Board (DNFSB) in their "Recommendation 94-1." This recommendation called for stabilization of one group of vulnerable materials within three years and a second group of materials within eight years. Kenley explained the DNFSB recommendations are equivalent to regulatorily imposed requirements.

Because of the short time frame to stabilize the 634 metric tons of material, DOE had to develop a process to identify technologies that could do the job. A version of the aerospace industries' system engineering approach was selected by the DOE team in charge of completing the DNFSB's 152 milestones.

To better explain the process, Kenley provided an example of the technology—distillation separation of chloride salts from plutonium—and showed how a team would rank the maturity of the technology by working it through the systems engineering evaluation summary. After all the data were tallied, the technology proved to be a medium risk item that could likely be employed to meet the November 1999 requirement.

Kenley explained that technical maturity is on a numbered system and consists of seven parameters. A technology has to be at a certain point before it can achieve a low number. For example, if National Environmental Policy Act (NEPA) documents have not been completed, the technology will have a higher implementation risk and have a higher score. Once NEPA is completed, the risks will sometimes drop by two or three numbers.

This approach has been extremely accurate in predicting credible technologies and implementation timeframes for the 94-1, Kenley said. In fact, a few technologies ranked as a high to medium risks did cause problems in the three-year stabilization plan.

Elfner asked if the approach has been used only for nuclear materials. Kenley said to date the approach has been applied specifically to the 94-1 program. Kenley added that DOE is using it as a first phase to identify the technical maturities for the approximately 60 technologies in the Needs Assessment study. Team members can run a technology through the process in 30 minutes.

Kenley concluded the presentation by saying that systems engineering is an effective approach for schedule-driven activities.

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