



SRS Citizens Advisory Board

Nuclear Materials Management Subcommittee

Meeting Record

March 23, 1998

Folly Island, SC

The Citizens Advisory Board (CAB) Nuclear Materials Management (NMM) Subcommittee met Monday, March 23, 2- 4:30 p.m. and 7 - 9:30 p.m. at the Holiday Inn, Folly Island, South Carolina. Subcommittee Chair Tom Costikyan resided at both meetings.

Board members present at the 2 - 4:30 p.m. meeting included Jimmy Mackey, Ed Tant, Ken Goad, Mary Elfner, and Karen Patterson. Department of Energy Savannah River (DOE-SR) representatives were Frank McCoy, Acting Deputy Manager, and Gerri Flemming Associate Deputy Designated Federal Official for DOE. Donna Martin attended from Westinghouse Savannah River Company. Lynn Waishwell attended from CRESP. Public attendees were Wade Waters, Ethan Brown, and Natalie LeBeau.

Attendees at the 7 - 9:30 p.m. meeting were Jimmy Mackey, Ed Tant, Ken Goad, Mary Elfner, and Brendolyn Jenkins. DOE-SR representatives were Charlie Anderson, Director, Reactors and Spent Fuel Division and Jean Ridley, invited speaker and Associate Deputy Designated Federal Official for DOE. Donna Martin attended from Westinghouse Savannah River Company. Tim Mettler and Myra Reese attended from South Carolina Department of Health and Environmental Control. Public attendees were Wade Waters, Ethan Brown, and Natalie LeBeau.

AFTERNOON MEETING: 2 - 4:30 p.m.

Introduction

Tom Costikyan opened the meeting and suggested the subcommittee take a step back to look at motions provided since the group began functioning in 1995 and identify potential future roles of the subcommittee.

Although the subcommittee has not submitted a great number of recommendations (10 total), Costikyan said all recommendations have been substantial and followed a general philosophy of suggesting DOE always consider safety and costs to the taxpayer. One issue continuously iterated by the subcommittee was concern that chemical processing was not being fairly evaluated as an alternative to stabilize nuclear materials.

Costikyan explained that many of the activities addressed by the subcommittee are subject to the schedule of the National Environmental Policy Act (NEPA). Before any major federal action can take place, an environmental impact statement (EIS) study must be conducted. Costikyan said

the subcommittee normally comments on a document during the scoping public comment period and the public comment period for the draft. He added that there is also a 30-day opportunity to comment on the final document.

Costikyan then summarized each recommendation (#5, #6, #20, #26, #29, #30, #42 and #52). Another topic which continued to come to the surface was that the subcommittee was generally supportive of the site being used to stabilize materials across the DOE complex if the method was cost effective and safe.

Concerning possibility of using the SRS canyons for stabilization, Ken Goad, CAB NMM subcommittee vice chair, said he participated in a study called the Processing Needs Assessment study headed by DOE-HQ to determine the amount of nuclear materials potentially needing to be stabilized in the canyons before they are shutdown.

Goad explained that DOE and contractors looked at the nation as a whole to identify disposition paths of nuclear materials at every DOE-owned facility. For example, DOE is committed to closing Rocky Flats by 2006, but to do so, materials will have to be removed from the site.

Costikyan said the CAB's posture has been to support the most efficient and cost effective ways to stabilize material and close sites, rather than for economical benefit because South Carolina wants the jobs. He added that if leaving material in place or moving material to a location other than SRS is more cost effective, then he and hopefully the subcommittee support the alternative. Ed Tant said one reason SRS is considered for stabilization activities often is because the site is most capable of doing the job.

Goad clarified to the subcommittee that using the canyons does not always mean processing. Various functions of the canyon operations could be used for stabilization activities other than chemical separation. He also said many sites have small amounts of material without a disposition path which could be easily included in the current canyon schedule of stabilizing SRS materials. The waste products would then go to the Defense Waste Processing Facility.

Costikyan said shutting down the canyons is an objective of DOE. He added that DOE is overlooking optimum use of the canyons as a result of nonproliferation concerns although he does not think chemical processing should be bypassed if it is more effective.

Karen Patterson agreed and said it would be foolhardy for DOE to shut down the canyons prematurely because it is one technology that is proven and works.

Costikyan emphasized DOE should not abandon the country's nonproliferation philosophy although interpretation of the policy may need to be reconsidered.

With discussion centered on chemical processing, Goad provided more details on the Processing Needs Assessment study. Goad explained DOE is grappling with a 50-year legacy of excess nuclear materials across the U.S. Scientists and engineers from various DOE sites joined to identify materials (plutonium, uranium and other), the form they were in and how each site proposed to dispose of the material. Goad said he attended four meetings at SRS and participated

in about five conference calls. He also said he had every opportunity to participate in the study and provide input yet not not feel like an outsider. Ed Lyman, Nuclear Control Institute, also participated.

Goad said the study, to be completed by April 1998, looks at material disposition as a national activity. To identify end states for materials, the engineers had to consider demographics, safety, transportation and if any new processes were available and demonstrated to stabilize materials. Goad said he was pleased to see the study conducted with a purely technical approach as rather than in the political arena.

Goad also said there appears to be support by many groups to close the SRS canyons although the facilities could play a vital role in closing other sites. The solution may be to stabilize as much material as possible, then close the canyons. What happens if you close the canyons and more work remains, Goad said. Will DOE have to build a new canyon?

Jimmy Mackey asked for the percentage of material to be chemically processed as a result of the study. Goad said DOE only "identified" the nationwide inventory, including the material that could go to the canyons. The amount was small enough to not impact the canyon schedule. Donna Martin also emphasized the Processing Needs Assessment study was not a decision document. Any decisions to send material through the canyons for processing must be covered by a NEPA document.

CAB NMM 1998 schedule

March Discussions

Costikyan began discussing the proposed NMM subcommittee activities for 1998. First on the list, and planned for the evening discussion, was a new proposal being considered by DOE to retrofit a Storage and Transfer Facility for treatment of spent fuel inside the L Reactor Building rather than building a facility from ground up.

Goad said using a facility already contaminated would be a good idea to save taxpayer money. Costikyan agreed but questioned the subcommittee on the general idea of such an issue as a subcommittee issue. All agreed the proposal should be considered by the CAB.

Goad cautioned that the reactor should be used only if it does not have to be rebuilt. Mackey, a procurement specialist with the Navy, agreed and said DOE should proceed with caution because upgrading buildings can sometimes be more costly than building a new facility.

Patterson asked if the proposed SRS SNF storage and transfer facility was a DOE project identified by the Nuclear Regulatory Commission (NRC) to assess potential regulation of DOE facilities by NRC.

Frank McCoy, DOE-SR acting Deputy Manager, said NRC did in fact look at a number of projects at Hanford, Oak Ridge and SRS to understand DOE's procedures, but not to externally regulate the facilities. Because the storage and transfer facility did not meet NRC's time frame,

DOE-SR proposed that the Receiving Basin for Offsite Fuels (RBOF) be considered. McCoy said DOE-SR felt RBOF would work well because NRC was primarily interested in the design of DOE facility and operation interfaces and procedures.

Costikyan asked if DOE guidelines would be replaced or superimposed if NRC did take over regulation of DOE activities. McCoy said he believes DOE guidelines are so similar to NRC regulations that there will be little difference in procedures if NRC is identified to regulate DOE. In response to questions by CAB members, McCoy said NRC reports to the president. He added that commercial fuel is similar to DOE spent nuclear fuel and should not present difficulties.

April, May, and June Projects

Costikyan proposed that April activities include a briefing on the Nuclear Material Integration (NMI) effort, started in February 1998, which Costikyan explained is an application of the Environmental Management Integration effort.

McCoy said consolidation of materials frees up money for other stabilization and environmental remediation activities. He said the NMI will be the "big picture" of nuclear material storage and disposition.

The National Research Council of the National Academy of Sciences will complete its study on the treatment and disposal of highly enriched uranium spent nuclear fuel in April according to the latest information from DOE. Costikyan explained that DOE-SR asked the group to conduct an independent study for DOE to consider in its selection of alternative technologies for stabilizing highly enriched SNF.

Costikyan said the subcommittee could also address the surplus plutonium disposition EIS, in particular, determining whether it supports or does not support conducting immobilization and possibly mixed oxide (MOX) activities at Savannah River Site to prepare the material for disposal of excess weapons grade plutonium.

Mary Elfner said she does not agree 100% with bringing materials to the site purely for economical benefits. Jobs should not be a driver, she added.

Costikyan agreed with Elfner and said DOE should not include jobs and economics into the agreement, rather, DOE should make decisions on the most effective way to manage problems. Tant added that jobs would just be icing on the cake.

Goad said DOE should make decisions on what is most cost effective and best for the country. Elfner said she does not think SRS should accept all materials simply because it is most cost effective. Safety should be the primary driver, she said. Elfner also said she was not completely comfortable with the CAB motion agreeing that SRS should take Rocky Flats plutonium residue. Elfner said she represents the public and she places strong emphasis on what the public perceives as risks.

Costikyan agreed with Elfner that the CAB should never endorse a recommendation which would create significant risks to the public or workers. Karen Patterson said the public should know the true risks and benefits, not perceived risks. However, Patterson stated strongly that the CAB should never ignore public sentiment, rather, it is the CAB's job to help the public understand the real issues. The CAB is a very informed group which has the obligation and responsibility to make decisions for the good of the public, she added.

Jimmy Mackey said the CAB should also inform and educate politicians on issues and decisions because politicians have more impact on the public than the CAB. Mackey said he has seldom seen public representatives come to subcommittee or full board meetings.

Patterson agreed that there may be benefit in the CAB talking more to politicians, not as a lobbying effort, but to provide information on CAB recommendations concerning DOE activities. She said a CAB legislative subcommittee may be an option to personally provide information to politicians instead of expecting politicians to attend CAB meetings.

Turning back to risks to the public, Elfner emphasized again that she has concerns with hearing that more wastes could be coming to SRS. Specifically, Elfner has concerns with the potential for groundwater contamination. When a recommendation is developed, Elfner said she needs to be able to explain to newspaper reporters or citizens the reasoning behind the recommendation.

Costikyan agreed it was important to have simple but specific answers to questions on CAB recommendations. At that point, all agreed a checklist could be used in finalizing recommendations. Safety and risks would be specific items on the checklist. Elfner said she felt very comfortable if future recommendations could address public health and environment. Patterson took action to develop a checklist for CAB approval.

July, August, and September Projects

Following discussion on risks, Costikyan proceeded with discussion of potential topics for CAB NMM involvement in July, August and September. Costikyan said if schedules remain on target, the subcommittee will likely develop a recommendation on the SRS Spent Nuclear Fuel draft EIS, make comments on a DOE-HQ nonproliferation study, and address decontamination of surplus reactors in July.

In September, Costikyan said the CAB NMM will play a strong role in the four-day American Nuclear Society Topical Meeting in Charleston on DOE Spent Nuclear Fuel and Fissile Material Management. The CAB will be responsible for hosting an educational resource room and working as the lead sponsor to develop a public workshop. ANS has also asked that a CAB representative speak during the plenary session.

Other Items

Costikyan asked if the subcommittee members had any thoughts on ways to be more effective and to get full involvement of the subcommittee. Costikyan said he wants to ensure any recommendations developed reflect the consensus of the group. Several members said they liked

the structure of the subcommittee and scheduling of meetings prior to the full board meetings. All agreed conference calls could be added to the subcommittee activities if well developed agendas and information is sent to each member in advance of the call to ensure a productive session.

In other business, Costikyan asked if the subcommittee should address recent comments by several groups against sending Rocky Flats plutonium residue to SRS for stabilization. All members agreed that they felt the CAB recommendation should stand and there should be no reason to address the comments since the group was responding directly to the Rocky Flats draft EIS.

In final business, Costikyan said the CAB NMM subcommittee may assist in researching and developing a recommendation on sending high level waste canisters to Yucca Mountain earlier than 2015 due to a potential of placing the canisters between drifts of commercial spent fuel as heat shielding.

EVENING MEETING: 7 - 9:30 p.m.

Introduction

Costikyan introduced Jean Ridley, program manager, DOE-SR Spent Fuel and Reactors Division, who provided a presentation on the Spent Nuclear Fuel Alternative Technology Program and the SNF Transfer and Storage Service Project. Ridley opened by saying the program deals specifically with how SRS will dispose of its aluminum-based spent nuclear fuel from foreign and domestic research reactors.

Ridley displayed a model of a fuel target and explained the fuel consists of 20% to 90% highly enriched uranium, clad with aluminum. When the fuel is placed into a reactor, up to 55% of the material is used (burnup), the element is then spent (used), taken out of the reactor, and shipped to SRS for storage.

Ridley compared the spent element to a battery. A used battery does not change size or shape after it loses its charge or power. The spent element is also very radioactive when it taken out of the reactor, she said. Jimmy Mackey asked if the fuel element is radioactive before it is placed in the reactor. Costikyan explained the radioactivity is so low that it could be held by a person without risk.

Ridley said spent nuclear fuel at SRS is currently stored in basins filled with water. Some of the spent fuel has been in wet basin storage for 25 years. SRS did have a situation with some of the aluminum clad fuel corroding, although all of the SNF identified with problems has been processed in the SRS canyons. The water chemistry has also been upgraded in the storage basin to prevent future corrosion of fuel, Ridley added.

The spent fuel is transported to SRS in large casks. Charlie Anderson, manager, DOE-SR Spent Fuel and Reactors Division, added that there are various sizes of spent fuel coming from many different reactors.

Ridley said the U.S. resumed return shipments of highly enriched uranium fuel to this country when an environmental impact was completed and a Record of Decision issued in 1996. In the decision, DOE said it would maintain processing options until 2000 to process any compromised fuel for health and safety concerns; however DOE mandated that a task team identify alternate treatment technologies to allow DOE to refrain from processing. In addition, DOE-HQ directed SRS to research the two most promising treatment technologies and identify the preferred treatment technique. SRS could look at only two technologies due to funding limitations.

Myra Reese, SCDHEC, asked what criteria were used to identify the top technologies. Ridley said costs, ease of implementation and ability to get the fuel in "road ready" condition were DOE's criteria.

SNF Alternate Technologies

The two technologies chosen were the melt and dilute and the direct-disposal/co-disposal. Benefits of melt and dilute include reduction of criticality and proliferation concerns because the fuel is below 20% uranium. Uranium above 20% poses proliferation risks. The spent fuel would be melted down in a crucible and placed in a co-disposal package surrounded by high level waste canisters. The direct disposal of spent fuel in the middle of a package creates more void space, Ridley said. In both cases, the high-level waste canisters and SNF canisters will be shipped separately and assembled at Yucca Mountain.

TRW, the company contracted by DOE to conduct Yucca Mountain activities, has performed two phases of criticality research for SRS, and is in the process of the third phase, Ridley said. In the first phase, TRW said boronated plates would have to be placed in the container with SNF before the package is placed in the repository. In phase II, TRW identified potential criticality issues thousands of years in the future if the SNF and high level waste logs both dissolve, the storage package is breached, and material leaks. To prevent criticality, gadoline phosphate would have to be added to the waste package. Ridley said SRS is not sure if gadolinium phosphate has ever been mass produced.

Anderson said gadolinium is recommended because it will dissolve at the same rate of uranium and move with uranium, acting as a poison to prevent criticality.

Phase III is underway now and will identify criticality concerns if the material and package degrade. Results will be given to SRS in June.

Concerning melt and dilute, Ridley said SRS has already conducted several benchscale tests with non irradiated fuel (1) to identify the amount of aluminum melted and (2) to determine how to capture any offgas fission products when the irradiated fuel is tested. The samples are being melted in a laboratory furnace in the Savannah River Technology Center.

Costikyan asked Ridley to identify the fission products expected to be released when a radioactive element is melted. Ridley said the primary fission products will be cesium and iodine. A filter will capture the fission products, which will then be washed out of the filter and

into the SRS high level waste stream. Other options for capturing the fission products are also being researched, Anderson added.

SRS will announce its preferred alternative to treat SNF in the SRS SNF draft EIS. Documents used to select a preferred alternative include the SRS SNF Alternatives Cost Study, WSRC Business Plan, DOE-HQ Nonproliferation Study, Nuclear Waste Technical Review Board study, National Academy of Sciences study and stakeholder comments, Ridley said.

Goad asked why DOE did not consider chemical processing since it is a technology already proven. Although processing will be included as an alternative in the SRS SNF draft EIS, Ridley said life cycle costs did not show the canyons to be cost effective. In addition, DOE had made the decision to stop operating the canyons by 2005.

Mackey asked if SRS will still be taking back fuel past the phase out of the canyons. Ridley said fuel will be returning from domestic reactors through 2035 in small amounts. She added that DOE could not afford to keep the canyons open to process only small amounts of fuel.

Ridley said DOE has asked WSRC to identify the preferred technology by June 1998. In addition, DOE-SR also requested Sandia Laboratory to develop a model to identify a preferred alternative. According to Ridley, the Sandia model is similar to the model WSRC will use to select a technology. Categories such as safety, cost, technical maturity, and public perception will have weighting factors.

Transfer and Storage Service Project

The Transfer and Storage Service Project will be a facility to implement the chosen alternate treatment technology for SNF, Ridley said. Currently, DOE-SR is reviewing two designs: a greenfield privatized facility (facility built from ground up) and retrofit of 105-L building.

According to Ridley, costs for the 105-L retrofit are estimated at \$150 million while the privatized, greenfield project is estimated at \$388 million. Ridley said the costs are higher for the greenfield project because this type of facility has never been constructed. Loans to construct such a facility would have higher finance charge rates due to unknowns. Mackey asked about the escalating factor to the outyear of 2035. Donna Martin said she would take action to find that information for Mackey.

Ridley said the 105-L retrofit was submitted to DOE the week prior to the CAB meeting. Potential benefits include lower capital costs, shorter construction and startup schedules and lower life cycle costs (lower operating staff, elimination of intra site transfer of SNF at L basin, earlier deinventory of RBOF) and elimination of decontamination and decommissioning costs.

Challenges of retrofitting 105-L include safety of the building (is it seismically sound?), decontamination costs and funding, Ridley said.

Mackey said the seismic estimations could result in high costs. Even small buildings are expensive to upgrade and sometimes more expensive than constructing a new building. Goad said it is likely the reactor is seismically sound because the reactors were upgraded in 1977.

Ridley said DOE is considering funding the facility in two-phases: design and construction. If Yucca Mountain requirements change, SRS could accommodate the changes more easily with the two-phase funding. If DOE does choose the 105-route, \$25 million would have to be taken out of privatization funding. She also said the 105-L alternative was not included in the DOE Environmental Management Accelerated Cleanup Plan.

Goad asked about the amount of spent fuel expected to come to SRS. Anderson said originally, about 18,000 fuel elements were identified to be shipped to SRS during the 13 year receipt program. SRS will now only receive about 11,000 elements. Countries choosing not to continue with the policy are Belgium, France and some middle eastern countries. Canada will not participate for at least three years while it reviews its current nuclear waste program, Anderson added.

Goad said DOE should consider sending as much material through the canyons as possible when there are breaks in the SRS stabilization program. Anderson said any fuel posing safety and health issues will be processed (Table 5.2-1)

Costikyan followed Goad's suggestion and asked if the SNF could be shipped to SRS at an earlier date and processed in the canyons before operations cease. Ridley said many reactors, including domestic reactors, are still operating and will continue to generate spent fuel. Goad said he does not support keeping the canyons open forever, but does believe DOE should maximize the capabilities of the facilities before they are shut down.

In closing, Anderson diagrammed DOE's concept of co-disposal, a method which could be used for melt and dilute or direct disposal of SNF. He said DOE's goal is to prepare the SNF for road ready condition before it is dry storing. Once SNF can be accepted at Yucca Mountain, SNF can be moved from dry storage directly to the shipping containers without additional treatment.

Finally, Costikyan asked if DOE had any plans to recover the uranium for the power industry. Anderson said DOE has conducted NEPA activities to use the weapons grade material for energy. He added that material can also be retrieved from Yucca Mountain until the facility is closed and sealed.

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