SRS Citizen's Advisory Board

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Risk Management and
Future Use Subcommittee

Meeting Record
September 11, 1997
Nancy Carson Public Library, North Augusta, SC

The Risk Management and Future Use (RM&FU) Subcommittee of the Savannah River Site (SRS) Citizens Advisory Board (CAB) met on September 11, 1997, at 6:30 p.m. at the Nancy Carson Public Library, North Augusta, South Carolina. Suzanne Matthews, Chair of the RM&FU Subcommittee, attended the meeting, as did Tom Rolka, South Carolina Department of Health and Environmental Control. Members of the public who attended were Tom Ballwog, R. S. Matthews, Russ Messick, Jerry Devitt, Don Morris, James Fiorillo, Bill Gerkin, Adrian Hill, James Little, W. L. Boettinger, Sam Booher, and Davida Johnson. Virginia Kay from the Department of Energy Savannah River Operations Office (DOE-SR) attended as the Associated Deputy Designated Federal Official. Gary Little and Bill Brumley also from DOE-SR attended. The Westinghouse Savannah River Company (WSRC) attendees were Warren Funk, Mike Hutcheson, and Gail Jernigan. Suzanne Matthews, Chairperson of the RM&FU Subcommittee, opened the meeting by welcoming everyone to the meeting and asked participants to introduce themselves. She then introduced Bill Brumley, Deputy Assistant Manager for the Office of National Security for DOE-SR, who gave a presentation on the current status and future plans for the tritium facilities at SRS.

Mr. Brumley explained that the current tritium mission includes: loading and unloading tritium reservoirs, managing the current inventory of tritium, maintaining reservoir surveillance, and assisting in the development of a new tritium source for DOE. He explained that SRS has 52% of the nation's supply of tritium, the largest inventory ever onsite. DOE strategies for the tritium facilities are to reduce environmental releases, continue productivity increases, upgrade and provide facilities to support the national security mission for the next 20-30 years, and continue to meet the Department of Defense requirements for limited life component exchange. Mr. Brumley provided graphs that showed how the amount of tritium released from SRS has been continually dropping over the past several years. He also explained that the number of people employed to support the project has dropped from 1030 to a current workforce of 741 people with productivity enhancements. The SRS Tritium Program funding will be approximately $73-74 million for the next two years. Line item spending will increase from approximately $5 million in fiscal year (FY) 1995 to a projected $92 million in FY 1999.

Mr. Brumley used a tritium facility schematic to explain the various tritium facility functions before describing the planned tritium projects. The first planned project he described was the Non-Nuclear Reconfiguration Project which relocates and re-establishes the tritium testing

component formerly performed at the Mound Plant in Ohio to SRS. One participant asked if SRS is performing any other missions from the Kansas City Plant. Mr. Brumley told the group that the Kansas City Plant had additional new missions as a result of the Non-Nuclear Reconfiguration. This $40 million Non-Nuclear Reconfiguration Project is scheduled for completion in September 1998. The National Environmental Policy Act (NEPA) documentation was determined to be a Finding of No Significant Impact, based on the results of an environmental assessment.

In explaining the Loading Line 6 modifications, Mr. Brumley explained that this project is considered one of the most important because it allows SRS to meet the needs for current weapons systems. With a capital cost of $12.2 million, construction is scheduled to be completed by July 1998. SRS is modernizing and consolidating existing process systems, equipment, and other functions from present buildings to other existing facilities as part of the Tritium Facility Modernization and Consolidation Project. DOE estimates this will save approximately $15 million per year. The capital cost for the project is $98 million, and plans are to complete this project by 2004.

Mr. Brumley also told the participants that the infrastructure upgrades will provide buildings and support systems to maintain tritium processing for the future. This essentially completes a 10-year vision with an estimated cost of $8 million. This plan includes a new office building to replace trailers, a computer support building to consolidate computer operations, and a modernization of the maintenance shops. These new facilities will be placed where buildings exist today; thereby minimizing the impact to the environment. DOE-SR expects to complete the projects by December 1999.

DOE plans to build a tritium extraction facility capable of extracting tritium from Tritium Producing Burnable Absorber Rods irradiated in Commercial Light Water Reactors and deliver tritium-containing gases to a tritium recycling facility. The capital cost for this project is $279 million, and construction for the project would be completed in 2005. An environmental impact statement (EIS) is being prepared, and a draft of the EIS is expected in February 1998. Mr. Brumley also briefly discussed the Accelerator Production of Tritium (APT). This project is to construct a linear accelerator-based system for the production of tritium to maintain the viability of the national nuclear weapons stockpile. It is expected to cost $3 billion and would be completed in June 2007. An EIS is being prepared, and the draft EIS is scheduled for release in November 1997. He concluded his presentation by stating that the Department of Defense continues to need tritium with any of the START treaties. The SRS Tritium Project has the best conduct of operations in the DOE Complex and the only accredited operators. He told the participants that the program is working to ensure the health and safety of employees and the public and to protect of the environment.

When asked if work on the APT is also being done at the national laboratories, Mr. Brumley explained that the work is being integrated between SRS and the national laboratories. Someone else asked what will happen to the 232-H Building. Mr. Brumley stated that since the half-life of tritium is so short (approximately 12.3 years), that the best way to deactivate this facility is to wait for natural activity to decay the tritium away. Because this is a hardened structure, there has

been some discussion on using this facility for plutonium pit manufacturing at SRS. However, plans have not been finalized, and many believe a new facility should be built.

Ms. Matthews thanked Mr. Brumley for his presentation. She then introduced Warren Funk who gave a presentation on the APT. Mr. Funk began his presentation by explaining the mission of the APT Project is to provide a fully operational tritium production facility for national defense using accelerator-based technology. He explained that the planned capacity of the APT is 2 kilograms per year, upgradable to 3 kilograms per year. Presently SRS is working with LANL, Burns and Roe Enterprises, Inc. (BREI), and General Atomics (GA). BREI and GA have teamed to act as prime contractor for the project. These groups have developed a team approach to the project and all activities are extremely well integrated. In fact, 18-20 people from SRS have been transferred to LANL temporarily to work on this project. They will return once construction at SRS begins. This facility will use 1700 million volts, as compared to the 800 million volts at LANL Accelerator. Mr. Funk explained that the APT would need 500 megawatts, in response to a question on the power supply. A participant also asked what will be the source of power. Mr. Funk told the participants that both SCE&G and the Southern Company have been approached and are receptive to the idea of supplying power for the APT. With the deregulation of the power companies, they believe they will be able to supply the necessary power for the APT. Someone asked if there had been any consideration to use Clark Hill. Mr. Funk said he would have to check with others to find out if this had been considered. Another question asked was if the power plants onsite had been considered as a power supply. Mr. Funk explained that the site power plants were too small to supply the amount of power needed for the APT. Someone else asked if the research that was being done at the accelerator in Texas, before it shutdown, could be done by this accelerator. Mr. Funk told the group that this would not be possible because the designs for the two accelerator are not the same. Mr. Funk further explained that the APT will use tungsten as the target of the accelerator. He told the group that the process would accelerate protons through the accelerator to tungsten nuclei, knocking out other energetic particles. These "knocked out" particles would then hit other tungsten nuclei, creating a cascade. The nuclei are then "cooled" by emitting other neutron and gamma rays in a process called "evaporation". The neutrons are then "captured" by helium-3 to make tritium. The advantages of the accelerator include the following:

- no fissile materials (no possibility of a criticality accident)
- no fission products
- no spent nuclear fuel produced
- relatively small amounts of low-level waste and no high-level waste with minimal environmental effects (There will highly radioactive material, but no high-level waste, as defined in regulations.)
- no nuclear proliferation issues
- capable of virtually instant shutdown
- continuous extraction of tritium which will result in lower inventories
- easily scaled to stockpile needs

Using an artist's conception of the project, Mr. Funk explained the functions of the various facilities, and explained that the preferred location is the former proposed site for the New Production Reactor. Mr. Booher asked if the site would be located in the "industrial zone" as

described in the Future Use Project Report and recommended by this subcommittee. Ms. Jernigan explained the preferred site is within the industrial zone.

In explaining some of the benefits and opportunities, Mr. Funk told the group that the construction of the APT might bring new opportunities in the production of medical isotopes, basic research, material research using neutrons, and cancer therapies using neutrons or protons. Mr. Funk stated that expected environmental impacts as described in the Tritium Supply and Recycling Final Programmatic Environmental Impact Statement (PEIS) include the use of 250 acres of land, 8 million gallons of construction groundwater per year, 22 million gallons of operation groundwater per year, and 1000 million gallons of operation surface water per year. Since this PEIS was prepared, the expected operation surface water has been corrected to 100-200 million gallons per year. The expected annual waste generation from this PEIS is as shown below:

low-level waste 544 cubic yard per year

mixed waste 7 cubic yards per year

hazardous waste 3 cubic yards per year

liquid sanitary waste 234 million gallons per year

sanitary solids 1240 cubic yards per year

cooling tower blowdown 240 million gallons per year

Using a schematic, Mr. Funk explained that most waste can be treated, stored, and/or disposed using existing SRS facilities. One stakeholder asked if the offsite vendor in the schematic included the Waste Isolation Pilot Plant. He also asked if the DWPF would be treating any of the waste. He expressed his concern that the wastes will be disposed at private industrial locations, instead of using existing federal sites. Mr. Funk explained that he did not know the answer but would find out for this stakeholder.

A participant asked why a proton was used instead of an electron. Mr. Funk explained that while an electron is easier to accelerate, the mass of the electron is very, very, small - too small for the accelerator to use to produce tritium. He further explained that a neutron is not used because a charged particle is needed for the process.

Another participant wanted to know if the APT used new technology. Mr. Funk said that this technology exists; however, the APT will be the most powerful. In answer to a question if this is the first production accelerator, Mr. Funk told the participants that there are accelerators producing medical isotopes now. One stakeholder asked if other countries are using accelerator technology. Mr. Funk explained that the French have a program to use an accelerator to make tritium, but that their accelerator is smaller, since their stockpile is smaller. Mr. Funk also mentioned using APT as a test bed for the destruction of the long-lived components of nuclear waste.

In answer to the question of the life expectancy, Mr. Funk said the planned life expectancy is 40 years. Someone else asked why do we need tritium. Mr. Funk explained that all weapons in our national nuclear stockpile require tritium. These weapons would not work as well, if at all, without tritium. Since the half-life of tritium is 12.3 years, a new supply of tritium is needed. Someone asked what the worst case scenario might be. Michael Hutcheson told the participants that the worst credible case would be to drop an 80-ton tungsten target while removing it during a refueling. Knowing this, designers are trying to mitigate this scenario through the design. Ms. Matthews thanked Mr. Funk for his presentation and the participants for attending and adjourned the meeting.

NOTE: To save costs for duplicating and mailing, handouts from the meeting will no longer be included in the distribution of the meeting notes. If you wish to have a copy of any of the handouts, please contact Gail Jernigan at 952-6969 or 800-249-8155.