SRS Citizen's Advisory Board

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Waste Management/Nuclear Materials Committees

Meeting Summary

June 18, 2002, 6:00 p.m.
North Augusta Community Center
North Augusta, SC

The Savannah River Site's (SRS) Citizens Advisory Board (CAB) Waste Management Committee (WMC) and Nuclear Materials Committee (NMC) met for a combined meeting on Tuesday, June 18, 2002 at the North Augusta Community Center in North Augusta, SC. The purpose of the meeting was to hear a discussion on the status of Americium/Curium; Low Curie Salt (LCS)/Saltstone Startup; a progress report on Transuranic (TRU) Waste; and hear public comment. Attendance was as follows:

CAB Members	Stakeholders	DOE/Contractors
Bill Willoughby	Lee Poe	Gerri Flemming, DOE
Jerry Devitt	Bill McDonell	Virgil Sauls, DOE
Perry Holcomb	Howard Dawson	George Mishra, DOE
Murray Riley	Don Moniak	Bill Brasel, DOE
William Lawrence	Robert Ingram	Sachiko McAlhany, DOE
Ann Dalton	Charles Utley	Peter Hudson, BNFL
Beckie Gaston-Dawson	Rick McLeod, CAB Tech Advisor	Troy Donahue, WSRC
		Kim Hauer, WSRC
		Sonny Goldston, WSRC
		Elmer Wilhite, WSRC
	Regulators	Monte Hawkins, WSRC
	None	Tor Osmundsen, WSRC
		Lyddie Broussard, WSRC
		Kelly Way, WSRC
		Helen Villasor, WSRC
		John Dickinson, WSRC
		Tom Burns, DNFSB

Bill Willoughby welcomed those in attendance, asked for introductions, and announced that two items on the agenda, Low Curie Salt/Saltstone Startup and progress report on Transuranic Waste would be reversed so that Dr. Thomas Burns of the Defense Nuclear Facilities Safety Board could make comments during the final public comment period regarding the DNFSB's perspective on current SRS HLW disposition activities.

Public Comments

During the public comment period, Don Moniak passed out copies of a media advisory while asking that the Department of Energy (DOE) provide the public with clarification of its current definition of waste versus material. Mr. Moniak noted his concern that at Oak Ridge, Americium/Curium (Am/Cm) is referred

to as an asset while at SRS it is being called a waste. Mr. Moniak then provided other key points such as the following:

- Claims approximately 90 percent of DOE materials have been removed from the University of South Carolina Aiken Public Reading Room.
- Disputes an article in the *Aiken Standard* concerning a confrontation at the library.
- Disputes that the public should have the burden of knowing if they have documents of a significant nature in their homes.
- Questions the timing of the removal process and noted the timeline since September 11, 2001, to the latest homeland security changes.
- Claims DOE is violating Freedom of Information Act (FOIA) laws since DOE documents have been removed from the Reading Room.

In response to Mr. Moniak's, public comments, Bill Willoughby said that he knew from firsthand experience that you cannot believe everything you read in the newspapers.

Americium/Curium Update

Troy Donahue opened his presentation by explaining that the goals of the program are to safely reduce risk and immobilize AmCm material in DWPF and to provide infrastructure and equipment to facilitate uninterrupted transfer of diluted AmCm material from F-Canyon to Tank 51H.

Mr. Donahue then explained the F canyon transfer route and the addition of depleted uranium, process water, and sodium hydroxide. Next, he explained the AmCm transfer route. The intent is to have no transfer interruptions; however, there is a vent and drain tank if this occurs. This is a typical of an F-area to H-area inter-area transfer.

When questioned about the nitrite/nitrate additives, Mr. Donahue explained that the current form of AmCm is extremely acidic, so highly concentrated sodium hydroxide is added to neutralize the material before it is sent to the Tank Farm. The sodium hydroxide and nitric acid combine to form sodium nitrate.

Mr. Donahue explained how the program looked at risks at multiple levels: the program, the project, and the operation levels to see what could go wrong and how the risks could be mitigated. He stated how the HLW transfer is a combination of two base operations: canyon receipts and inter-area line transfers, therefore, the combination is a new process.

The disposition process creates no new hazards. The accident consequences met the current F-Canyon and Tank Farm Authorization Basis (AB) with one exception. New controls had to be implemented to handle the increased hydrogen generation rate of AmCm in the H-Diversion Box number 8 (HDB-8) facility.

Mr. Donahue explained the transfer into Tank 51. It is treated as a critical evolution. The source term and Alpha loading were higher than typical, but not outside of the parameters previously experienced anywhere else in HLW. When questioned about the meaning of critical evolution, Mr. Donahue explained that there is much focus on the transfer because HLW wants no interruptions. This is not a criticality issue.

When asked where the material ends up, Mr. Donahue explained that it goes to Tank 51 and eventually is vitrified in DWPF.

Mr. Donahue outlined the AmCm F-canyon project scope. There are two bi-cell tanks and one neutralization tank. Jumpers were fabricated for adding uranium to the neutralization tank. The uranium is added to lower the high activity of the settled material and to enhance removal of the AmCm from

solution. Next, he discussed the purge/isolation modifications. The air/nitrogen addition system for neutralization and bi cell tanks is complete and the isolation of the cooling water system to the bi-cell tanks is complete. Finally, Mr. Donahue explained the transfer reliability modifications. 14 of the 16 planned installations of transfer jumpers are complete. The transfer modifications for feed to waste header #3 are also complete.

The HLW portion of the project scope consists of several modifications, as well. Agitator installation and dip tube replacements are complete, and several transfer-related modifications have been made. A Tank 51 Alpha continuous air monitor installation is in progress. A cold run simulant transfer is pending, procedures and training are in progress, and a Readiness Assessment has begun.

Mr. Poe expressed concern about the HEPA filters through which materials will pass. Mr. Donahue assured the group that all pump tanks through which the material will pass have HEPA filtered ventilation. Mr. Poe stated that the waste header in F-Canyon did not have HEPA filtration when he worked there. A question came up concerning the potential for criticality. An analysis was done to show that criticality was not possible unless the materials were separated and that there was no process in the tank farm that could separate the materials.

Mr. Donahue outlined the schedule. A cold run transfer is scheduled for June 24, project mods completed by August, fabricate and install jumpers completed, (7 jumpers gave double valve isolation with long term benefits), F Canyon ready for AmCm transfer in October, HLW ready for transfer in November, and the transfer complete in November.

Mr. Willoughby asked about the cold run and what would not be simulated for the hot run. Mr. Donahue stated that the material used would not have the source term of the hot run.

When asked about leakage during the transfer, Mr. Donahue stated that the transfer would be halted. Mr. Holcomb encouraged the group to simulate the americium/curium using rare earth simulants to cover all safety issues. Mr. Donahue stated the AmCm had been treated in the laboratory with all the chemicals it was going to be exposed to and no undesirable reactions were found.

Next, Mr. Donahue discussed project costs with the group. The risk assessments have gone as planned and thus far SR is true to budget. Mr. Willoughby asked that the group be supplied with the Critical Path Map (CPM). He also asked that someone make this presentation to the full CAB in Columbia in July.

Mr. Donahue continued by discussing the AmCm disposition. 100 percent of the AmCm material will go to the DWPF as direct feed. He told the group that blending the mixture with F tank farm sludge makes a better sludge for making glass at DWPF. Sludge batch 3 will primarily be composed of material currently contained in Tank 7.

Mr. Poe expressed safety concerns and would like to see any Safety Analyses that have been done. He believes the higher concentration of actinides and radionuclides through this system than ever before pose some risk. Mr. Donahue offered to provide Mr. Poe with the AmCm Safety Strategy. Mr. Willoughby asked that all statements referring to HEPA filtration made in this presentation be verified and confirmed as true.

Mr. Donahue concluded his presentation by assuring the committee that the AmCm transfer to HLW is safe, is similar to base operations, and reduces AmCm risk via immobilization.

Transuranic Waste Progress Report

In opening his presentation, Mr. Goldston first introduced Virgil Sauls, DOE-SR Manager of Waste Operations Division. Mr. Goldston then noted that DOE-SR and the DOE Carlsbad Field Office (CBFO)

negotiated accelerating SRS shipments in exchange for receipt of Mound Site (approximately 300 cubic meters) TRU waste. Mr. Goldston emphasized that the South Carolina Department of Health and Environmental Control (SCDHEC) has agreed to two drums of SRS waste to be shipped in exchange for each Mound drum-equivalent received. Mr. Goldston clarified that this ratio of two to one agreement is for drums that are shipped over and above the baseline 12 shipments per year that have already been planned.

Explaining that CBFO deployed a mobile characterization vendor to augment SRS characterization and shipping capacity, Mr. Goldston said that 80 shipments were now planned in fiscal year 2003. This included the 12 baseline shipments and 68 shipments to account for the ratio of two to one receipt of Mound waste. To date, approximately 300 drums have been physically characterized and at this current rate, there are expectations to support the 80 shipments in fiscal year 2003.

Mr. Goldston said that the issue at hand is that WIPP is currently limited to approximately 25 shipments per week because of restrictions for funding for truck drivers, TRUPACT containers, and disposal operations. In addition, DOE-HQ has made commitments to Rocky Flats and Idaho for virtually all shipping capacity in fiscal year 2002. While SRS has been notified to plan for 12 shipments in 2002, CBFO is tentatively planning the SRS shipping campaign in fiscal year 2003 to achieve the Mound objective. SRS is expecting to make the 12 shipments commitment in 2002, but is attempting to make four more for a total of 16.

Mr. Goldston said by way of an update, SRS was notified that Idaho has been experiencing delays in the preparation of its TRU waste shipments to WIPP; therefore, one TRUPACT II (which holds three shipping containers) was allotted to SRS to make one shipment. However, in response to a question as to whether the delays would continue and more TRUPACT IIs would be made available, Mr. Goldston replied that each attendee's information packet contained a letter from Jessie Roberson in response to CAB Recommendation #153, "TRU Waste Priority and Off-Site Shipments". In her letter, Deputy Secretary Roberson expressed DOE's intent to make 15 additional shipments from SRS later this fiscal year. In response to a comment that there is nothing in the letter showing a commitment, Mr. Goldston said that he felt confident that Ms. Roberson recognizes that this is a priority issue for DOE. Mr. Goldston also stated that he was sure that the CAB's hard work in sending recommendations to DOE-HQ on transuranic waste has had a great impact on how DOE-HQ is supporting the acceleration of shipments from SRS. Prior to the motion, Mr. Goldston said SRS was on a bad track and might not have made the schedule, but the CAB has helped a great deal and SRS appreciates it.

Concluding his presentation, Mr. Goldston restated that while the availability of TRUPACT II shipping containers is limiting near-term SRS shipments to WIPP, the entire TRU program could be accelerated though additional funding under the Contract Reform Initiative proposals and would also address the CAB's concern about accelerating high activity TRU shipments to WIPP. For example, a Category 2 facility would provide for more characterization ability and would remotely handle higher activity TRU waste. When asked if an estimate of cost was available, Mr. Goldston responded that as soon as the numbers were available, the CAB would be briefed. Several requests were then made by the attendees to keep the CAB informed on all TRU activities since this was one of the CAB's priority issues. While SRS still plans to pursue an aggressive schedule to ship TRU waste to WIPP, Mr. Goldston said it was crucial for the attendees to submit their input to the Draft Performance Management Plan on those aspects of the programs that are most important to them.

Several comments and questions followed Mr. Goldston's presentation. For example, Don Moniak said that describing hazard is a communication issue and that people are being misled about the calculations for determining the amount of waste shipped to the amount of waste received from Mound. Mr. Goldston clarified that two drums of SRS waste will be shipped in exchange for each Mound drum-equivalent. However, Mr. Goldston said it was important to keep in mind that the Mound waste is coming to SRS by rail, which allows for more containers than are used in the TRUPACT-II transporters. Mr. Moniak then asked for a copy of the Waste Generation Forecast, which he said had been removed from the public reading room at USCA. Mr. Moniak commented that there is not enough TRUPACT-IIs for all of the

scheduled shipments to be made and asked if WSRC was receiving privileged information from WIPP. Mr. Goldston responded that while more TRUPACT-IIs are being built, through its recommendations, the CAB helped a great deal for SRS to receive priority status on TRUPACT-II availability. Mr. Moniak then asked that Mr. Goldston also provide him with cost information on a TRUPACT-II transporter.

Given the importance and interest of the situation, Bill Willoughby asked that Rick McLeod, the CAB's technical advisor begin work on drafting a motion on TRU waste for consideration at the next WMC meeting. Lee Poe added that he thought it was important to also add a recommendation to the draft motion that DOE should begin to look at the TRU waste definition and change it from greater than 100 nanocuries per gram to greater than 500 nanocuries per gram. Mr. Poe said this was an urgent issue that certainly needs to be addressed.

Update on Low Curie Salt/Saltstone Startup

Tor Osmundsen opened his presentation by noting that the major objectives of the Low Curie Salt/Saltstone Startup is to accelerate risk reduction by emptying tanks sooner and processing three salt tanks by 2007 to the Saltstone vaults, and to provide additional tank farm flexibility. Mr. Osmundsen then provided a brief overview of the initial salt processing program and said that three to five percent of the total Cesium–137 (CS-137) inventory would be disposed at Saltstone. Mr. Osmundsen further explained the steps of the low curie salt treatment, which include:

- Separation of sludge from soluble waste
- Formation of salt cake from the evaporation and fractional crystallization of the soluble waste
- Separation of the remaining concentrated supernate from the salt cake (cesium is the most soluble constituent and tends to remain in the supernate)
- Dissolution of the drained salt cake, settling of insolubles and transfer to Tank 50
- Adjust the salt concentration to a range compatible with Saltstone processing

Mr. Osmundsen explained that to qualify the contents of Tank 50 to meet low level-waste disposal requirements, the following actions would be required:

- Performance Assessment for the protection of the public and the environment (to South Carolina Department of Health and Environmental Control (SCDHEC) Drinking Water Standards at the point of compliance
- Nuclear Regulatory Commission (NRC) limits for Class C
- SCDHEC permit conditions
- Safety basis
- Design features, As Low As Reasonably Achievable (ALARA), etc.

However, Mr. Osmundsen quickly pointed out that the material would be returned to the Tank Farm if qualification failed. Using a cartoon chart to show the steps in the Low Curie Salt (LCS) process, Mr. Osmundsen said the first step is to "mine" a salt well and install a pumping system near the tank bottom. Step two involves draining the salt cake by pumping liquid from the bottom of the well where the high curie content liquid is removed. In step three, the pumping system inside the well is raised to avoid the remaining high curie liquid. Step four is to add clean water to the tank to dissolve the drained salt and pump out the resulting low curie salt solution. Step five calls for an analysis of the dissolved salt solution to ensure that it meets the disposal criteria.

Mr. Osmundsen briefly discussed minor chemical changes in the low-level waste characteristics for Saltstone. For example, less solid waste is produced as a result of the higher salt concentration, the concentrations would vary inversely with the water content (the LCS stream is projected to be nearly one-third more concentrated), and the potassium nitrate (KNO3), and mercury salts are larger than 1988 permit values since they are no longer removed by precipitation with sodium tetraphenylborate. Mr. Osmundsen said the bottom line is that the chemical changes are within the Saltstone formulation

envelope with no changes expected in the toxic characteristic leaching procedure (TCLP) response and/or in the overall environmental response.

In terms of changes in radionuclides for the low-level grout characteristics for Saltstone, Mr. Osmundsen presented that the water content is reduced by 17 percent. In addition, Cobalt 60, Promethium-147, and Europium-154 increase since the LCS process does not filter out entrained sludge. Strontium-90 and Plutonium-238 increase since monosodiumtitanate is not used to sorb and then filter these materials and Cesium-137 increases since tetraphenylborate is not used and not all interstitial supernate is drained from the salt cake. However, Mr. Osmundsen said that the existing vaults are commensurate with the NRC Class C requirements and that the compositional changes do not result in changes in the environmental response.

Mr. Osmundsen presented a chart that depicts the low curie Saltstone versus the NRC waste class for cesium and noted that while the cesium level will increase it falls just above the B limit on the chart, with an alpha limit of 99. To explain how material in the high level waste system can be managed as low-level waste, Mr. Osmundsen said that a waste incidental to reprocessing (WIR) evaluation (DOE Order 435.1) is required to allow salt cake to be disposed in Saltstone. However, to meet WIR requirements, waste must be processed to remove key radionuclides to the maximum extent technically and economically practical; meet safety requirements comparable to performance objectives set out by the NRC in 10CFR61; and be incorporated into a solid physical form that does not exceed NRC Class C concentration limits or meet alternative requirements. Mr. Osmundsen said that WIR for LCS processing was submitted by WSRC in December 2001 and was approved by DOE in March 2002. When questioned by Mr. Poe, Mr Osmundsen clarified that DOE has agreed that this is waste incidental to reprocessing and can be handled as low level waste.

In closing, Mr. Osmundsen said that LCS processing discussions with SCDHEC have been encouraging and activities are underway, with the transfer of free supernate from Tank 41 completed, Saltstone restarted April 22, 2002 (emptying existing Tank 50 contents), and the draining and dissolution transfer system is in fabrication.

Mr. Poe commented that he a read about a leak in the paper. Mr. Osmundsen clarified the leak occurred in the Saltstone facility and was legacy waste from Tank 50; not Low Curie Salt.

Public Comment

During the public comment period, Dr. Thomas Burns of the DNFSB provided a brief presentation on the Board's perspective on current SRS HLW disposition activities, including Salt Disposition, Tank Integrity and Tank Space. Dr. Burns opened by noting that the DNFSB is encouraged by the CRA initiatives and wishes to be kept informed on the activities related to the Draft PMP.

Dr. Burns provided the CAB with background information on the DNFSB by explaining that the DNFSB is an independent federal oversight agency charged with ensuring that the activities at DOE defense nuclear facilities are conducted in a manner that adequately protects the safety of the public, workers, and the environment. Dr. Burns then invited the attendees to visit the DNFSB website athttp://www.dnfsb.gov to view the recent Board's letters on HLW activities. Dr. Burns said that the Board's objective regarding HLW us to achieve risk reduction in the SRS HLW system by dispositioning waste and closing tanks in a safe and expedited manner. Subtiers of this objective include the following:

- Identifying safe and technically sound disposition paths and end-states
- Adopting robust disposition plans that account for technical, financial and regulatory uncertainties
- Executing waste disposition and tank closure activities in a safe manner

Dr. Burns then reviewed some of the Board perspectives that are related to Low-Activity Salt Direct to Saltstone; Caustic Side Solution Extraction; Alt Cs Removal Technologies; Increased Feed Rate;

Increased Canister Loading; Sludge Preparation; Minimizing DWPF Recycle Influent Stream; Returning Former In-Tank Precipitation (ITP) Tanks to Service; and Continue to Improve Tank Closure Processes.

In summary, Dr. Burns said that the Board believes that DOE should continue to pursue aggressive disposition strategies but that it should plan realistically for technical, financial and regulatory uncertainties.

Mr. Willoughby adjourned the meeting at 9:15 p.m.

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