



## **SRS Citizens Advisory Board**

### **Waste Management Committee**

#### **Meeting Summary**

April 16, 2002  
Aiken Federal Building  
Aiken, SC

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The Waste Management Committee (WMC) of the Savannah River Site (SRS) Citizens Advisory Board (CAB) met at the Federal Building, Aiken, SC on April 16, 2002. Attendance was as follows:

#### **CAB Members**

Bill Willoughby\*  
Lola Richardson  
Murray Riley  
Perry Holcomb\*  
William Lawrence\*  
Karen Patterson\*  
Vera Jordon\*

#### **Stakeholders**

Bill McDonell  
John Austin, SAIC  
Mike French  
Rick McLeod, CAB Tech Advisor  
Frank Carl  
Gerard Voos, SCUREF  
Gary Benda, US Energy Corp.  
Lee Poe

#### **DOE/Contractors**

Tor Osmundsen, WSRC  
Julie Petersen, DOE  
Gerri Flemming, DOE  
Neil Davis, WSRC  
Sonny Goldston, WSRC  
Larry Ling, DOE  
Kelly Way, WSRC  
Allen Thomas, WSRC  
Chuck Hayes, WSRC  
Elmer Wilhite, WSRC  
T.J. Spears, DOE  
Peter Hudson, BNFL  
Charlie Anderson, DOE  
Bill Clark, DOE

\*Denotes members of the WMC.

Bill Willoughby opened the meeting at 5:00 p.m. by inviting introductions and thanking everyone for coming.

#### **Waste Incidental to Reprocessing (WIR) -Larry Ling, DOE**

Mr. Ling outlined the definition and history of incidental waste. He pointed out that High Level Waste (HLW) is a source term definition, and if SRS can prove the "heel" of waste left in the HLW tanks after bulk waste removal meets the incidental waste criteria, it can be managed as either low-level or transuranic waste and not high-level waste. Mr. Ling pointed out that the Nuclear Regulatory Commission (NRC) first introduced the term.

NRC recognized that the Saltstone waste stream could meet the incidental waste criteria and noted other waste streams within HLW that could be considered incidental, as well.

Mr. Ling outlined the three criteria that the NRC developed (Bernero/Lytle letter) in response to a petition regarding disposal of waste at the Hanford site to determine WIR. NRC stated that if this waste met three criteria, then it could be managed as other than high-level waste.

Since there was no specific DOE order applying incidental waste criteria determinations to HLW, with regard to tank closure, DOE-SR developed closure criteria following the Bernero/Lytle letter guidelines and other established regulatory and DOE requirements. DOE initiated discussions with NRC in April 1996. DOE determined that all 51 tanks could meet the incidental waste definition. In a series of NRC interactions, NRC had no objection to how DOE applied the methodology. Additionally, South Carolina Department of Health and Environmental Control (SCDHEC) and Environmental Protection Agency (EPA) approved the General Closure Plan in July 1996, and DOE closed two tanks in July and December 1997.

In July 1999, DOE order 435.1 was issued to replace DOE Order 5820.2A. This order provided two processes -citation or evaluation- to determine whether spent nuclear fuel reprocessing plant waste will be managed as another waste type or as HLW. Citing waste doesn't require an evaluation. These items, by citation, can be determined to be incidental.

The evaluation process allows management of waste as low level or TRU. Mr. Ling explained the criteria that must be met to manage waste as low level and TRU, as well as the safety requirements of 10 CFR 61.33 that must be met.

Mr. Holcomb asked for more clarification. Mr. Ling responded that the regulators have bought into the WIR process. DHEC and EPA both understand the process and realize that if the residual waste meets the WIR requirements there are no impacts to the environment. Mr. Anderson added that if there were enough HLW left in the tanks and the WIR requirements could not be met, then SR would not close the tanks. There will always be a little residual waste left, no matter how extensively you clean. However, there comes a point where you have done enough, spent enough money, and are being protective of the environment. There is a point where the waste left is incidental waste and can be managed as other than high-level waste. He reminded everyone that DOE's ultimate goal is protecting the environment.

Mr. McDonnell asked about the grout filled tanks affecting the environment, and he asked about the court challenge. Mr. Ling answered that initially the Natural Resources Defense Council (NRDC) filed a petition with the NRC because they thought DOE was reclassifying waste and that the NRC should regulate the closed high-level waste tanks at SRS. In 1998, the NRC denied the NRDC petition. NRDC wants DOE to "greenfield" all DOE sites and filed a petition in Idaho last year with the Snake River Alliance asking the District Court to throw out DOE Order 435.1 because they felt that the Order allowed DOE to reclassify waste. The case was referred to the Circuit Court, which remanded the case back to the District Court. NRDC re-filed it as a complaint at the first of this year (2002). DOE is planning to file arguments on the case by the end of April 2002. The case is still in progress.

Mr. Austin, retired from NRC, stated that he was on the concurrence chain for Bernero/Lytle letter. He stressed that HLW is a definition. According to the definition, anything that comes into contact with HLW could be HLW. He stated that if one focuses on the definition of HLW, this entire exercise doesn't make any sense. Working at the 10th significant figure, or beyond the first generation of the waste, doesn't make sense.

Mr. Hudson commented that the definition used in the United Kingdom doesn't go beyond the first definition and cuts out all of this controversy.

### **Low Curie Waste - Tor Osmundsen, WSRC**

Mr. Osmundsen told the group that he was given a challenge- to figure out what to do with salt, but at the same time, empty tanks sooner, increase operational flexibility, and accelerate risk reduction. He continued with a background of SRS waste treatment. He explained salt cake and supernate, outlined the

waste inventory and described how 17 Million gallons of salt cake solid and concentrated supernate liquid can turn into 80M gallons of dissolved salt waste solution.

He then explained the salt processing program and the different paths-forward for the salt wastes. One path is for the low curie salt (13M gallons) to go to Tank 50 then to the Saltstone vaults. The low cure/high actinide salt, which makes up 17M gallons of the 80M gallon total dissolved salt waste inventory, would go through an actinide removal process with the low curie low actinide going to the Saltstone vaults and the small volume of actinides going to DWPF. The remainder of the waste (50M gallons) will undergo Cesium removal at the Salt Waste Processing Facility (SWPF).

Next Mr. Osmundsen outlined the treatment steps. He explained how a hole (or shaft) is mined down through the salt to create a well and how the supernate is pumped out through the salt. This is being done in Tank 37 now for desalting only.

Mr. Poe asked about cooling coil leaks and previous problems the site has faced. He questioned the structural integrity of the tanks. Mr. Willis answered that the expectation is that the salt level will be lowered evenly. He also emphasized that the cooling coil situation and tank integrity are being examined for each tank that will undergo salt removal.

Mr. Osmundsen continued explaining the process. SRS will add water to dissolve as much salt as possible at the top. The plan is to dissolve the drained saltcake and to make sure at the same time that this mixture is compatible with grout.

Mr. McDonnell asked about the amount of cesium (Cs) in the liquid. To which Mr. Osmundsen responded that is one of the areas that HLW aren't sure how much Cs is left in the "holes of the sponge". Mr. Willis added the worst case scenario would require HLW to go back and do another rinse. There are other treatment steps to get low curie salt into Tank 50 eventually.

Mr. Osmundsen continued with the qualification of the Tank 50 contents to meet low level waste disposal requirements. He added that Saltstone is due to start up this week. He stated that SRS must be careful to select the tanks with low actinide. He added that Tank 50 is the adjustment tank. If, after "adjustment", the Tank 50 contents fail to meet the WIR and permit requirements, then the waste is sent back to the tank farms.

Mr. Osmundsen showed the group two charts- one chemical and one radionuclide-of the low-level waste characteristics for Saltstone. He explained the reasons for the higher salt concentrations and talked about the Performance Assessment (PA) that is being developed. He explained how the chemical formulas are within the Saltstone formulation envelope, how the existing vaults are commensurate with NRC Class C requirements, and how the compositional changes do not result in changes in the environmental response (protection).

Ms. Patterson asked about the problem with Saltstone and nitrate leaching. Mr. Wilhite agreed that the nitrates are a bit higher, but there is enough buffer that increased levels are not a worry. SRS is taking great pains to avoid making the waste RCRA hazardous.

Mr. McDonnell asked about the mercury content of the chosen tanks. Mr. Goldston responded that only tanks with low mercury content that pass the TCLP test are chosen.

Mr. McLeod asked about the PA for Tank 50 and the radionuclides. Mr. Wilhite clarified that the upper limits of radionuclides are used in the PA's, and that these calculations aren't tied to the tanks from which the waste is being removed. The Tank 50 feed should be ready by August.

Mr. Willoughby asked about the Cs levels on the chart as compared to the technetium levels in the past. Mr. Wilhite explained that the Cs increase is totally immaterial from an environmental protection of the public aspect because the Cs is bound in the Saltstone and becomes immobile, as compared to the nitrate. Technetium was the radionuclide that got closer to the limits before the formulation was changed to include slag. The goal is to remain under the NRC Class C limit. The PA shows the isotopes are relatively immobile.

Mr. Osmundsen continued that the WIR process is used to umbrella this criteria for low curie salt. There are no numbers in the order to determine the standards for "technically and economically practical". The chart we have comprised meets 10CFR61. The NRC was consulted, and DOE has approved it.

Mr. Osmundsen continued by explaining how material in the HLW system can be managed as LLW. He explained the WIR evaluation and requirements that must be met in order for salt cake to be disposed of in Saltstone.

Ms. Patterson suggested that public meetings are needed to inform the public on what is being done now. It looks as though DOE and WSRC are doing something different from what was presented to stakeholders originally. Mr. Poe agreed that it would be prudent to hold a meeting to inform the public of the waste amount, the proposed plans to dispose of it, and the risks.

Mr. Anderson told the group that this issue is bounded by NEPA and all NEPA requirements have been met. He added that there was public attention given to this issue last July and August, and many lengthy dialogues have transpired. He added that the Environmental Impact Statement (EIS) covered all of the alternatives, and that direct grout was recognized as an acceptable disposal of waste at the SRS.

After discussion, the group agreed that a public meeting tacked onto another meeting, such as a WM committee, may be the route to take. To hold a separate public meeting would probably confuse the public because the issues would be presented out of context.

Mr. Osmundsen gave the status of the low curie salt. The WIR has been approved by DOE-SR, discussions with SCDHEC have been encouraging, and the SCDHEC Permit Notification package has been delivered. A response to the Permit information is expected by September. He added that salt dissolution has begun with Tank 37 and that. Tank 41 will be the first LCS tank and will begin the supernate transfer drain by April 22, 2002. SS restart is close, and the facility can then process legacy waste from Tank 50.

Mr. McDonell asked about the low curie/high actinide salt. Mr. Osmundsen explained the Actinide Removal process would handle this waste stream, and it is scheduled to begin construction in the next calendar year time frame.

Mr. Willoughby mentioned that the CIF Focus Group had just learned that the aqueous material from CIF is going to SS and asked how those were going to be integrated and how the aqueous portion would be incorporated. Mr. Goldston responded that the waste would have to meet all the criteria Mr. Osmundsen had laid out.

Mr. Willoughby also mentioned that this plan had been presented to DHEC. He would like Mr. Osmundsen to present a schedule to the WM Committee and/or CAB. It seems to be a plan for action and the WM Committee would like to see the plan. Mr. Goldston answered that August may be a good time to present a schedule. He added that SRS would have to notify DHEC of a feed change in a separate notification.

**New Waste Removal, Neil Davis, WSRC**

Next Mr. Davis spoke to the group on, what is referred to as New Waste Removal.

Mr. Davis provided background and history for the group. He told the group that the average capital cost of retrofitting a tank for sludge removal is \$17M and \$13.5 M for salt. The average cost of closing two tanks was \$4M per tank. Tank Closure requirements drive what HLW has to do in waste removal. Mr. Davis wants to make a significant cost reduction in waste removal. He has been issued a 30-85% cost reduction challenge. He told the group how he proposes to reduce the capital costs.

Mr. Davis explained that sludge removal is more difficult than salt removal and focused his next few slides on explaining the process. He mentioned that waste removal is the most expensive step in the process. His driver for saving money is being able to set aside the money for other high priority initiatives such as the low curie salt to Saltstone process about which Mr. Osmundsen had just spoken.

Mr. Davis explained that there are two federal requirements that SRS must meet. The first is to ensure that a theoretical man at the F Tank Farm Point of Compliance receives no more than 4 mrem/year of beta-gamma exposure. SRS easily met this standard on the two tanks that have been closed.

The second requirement is to meet Clean Water Act standards at the Point of Compliance. These standards refer to the allowable concentration of metals and other chemical compounds at the Point of Compliance. These requirements were easily met on the two tanks that have been closed.

Mr. Davis then outlined DOE Order Requirements and Regulatory Commitments. These imply that no more than 1,000 gallons of waste, on average, will be left in a tank at the time of closure. Mr. Davis explained that Tank 19 is ready to close even though there are 15,000 gallons of residual waste in the tank. This is because this waste has a much lower concentration of harmful constituents than the average waste. Mr. Davis emphasized that closure requirements should be based on the source term of the waste in the tank instead of the volume. The source term takes into account the specific characteristics of the waste, e.g., the amount of harmful constituents.

Mr. McLeod asked how SRS could circumvent the gallon-based argument submitted in the closure plan. Mr. Davis responded that the gallon-based criteria are not regulatory-based commitment. SRS would prefer using a source term based argument as it more accurately reflects the hazard associated with the waste. Mr. Davis did point out that the source term based argument is expected to drive the allowable volume of residual waste left in a tank at the time of closure well below 1,000 gallons for tanks that contain "hotter" waste, e.g., waste that contains a high concentration of harmful constituents.

Mr. Davis told the group that a lot of money is spent on how the process is controlled and he is looking to reduce costs there. In the past, waste removal was controlled from a central location. In the future, the process will be controlled locally at the tank top.

Mr. Davis explained all of the functions required to remove waste from a tank and what equipment is currently being used to perform those functions. Several alternatives were discussed that should provide equal waste removal performance as a significantly reduced cost.

Assuming that SRS is required to get virtually all of the waste out before closing a tank, Mr. Davis discussed the use of mild acids to dissolve the waste and thus make it easy to pump out. Several different acids are being tested to develop the best combination of waste removal efficiency without creating chemical compatibility problems in other parts of the High Level Waste process such as in DWPF or Saltstone.

Mr. Davis then talked about various ways to prepare and transfer annulus waste. Mr. Poe mentioned that there is an outstanding CAB motion that requires DOE to schedule a demonstration of annulus cleaning. He sees this is an undemonstrated and therefore unknown part of the process.

Mr. Poe questioned that the top to bottom review and Federal and State requirements. He reiterated the benefit of re-evaluating specific requirements; such as the 4-mrem/year exposure requirement discussed above and questioned the health benefit. He asked if these are legitimate recommendations or requirements.

### **Public Comment**

Mr. Willoughby asked for public comment. There being none, he mentioned the following. He told the group that this meeting was held to concentrate on HLW because the Waste Management committee needs to spend more time with HLW issues. He also mentioned that he was going to ask that the CIF Focus Group be extended another year. Finally, he asked the committee to think about any recommendations that could come from this meeting.

Bill Willoughby adjourned the meeting at 8:30 p.m.

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