SRS Citizen's Advisory Board

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Waste Management Committee

Aiken Federal Building, Aiken, SC
February 12, 2004

The SRS Citizens Advisory Board (CAB) Waste Management Committee (WMC) met on February 12, 2004, 5:00, at the Federal Building, Aiken, SC. The purposes of the meeting were to discuss Waste on Wheels, annulus cleaning, and to receive public comment.

Attendance was as follows:

CAB Members	**Stakeholders**	**DOE/Contractors**
-Harold Rahn	Bill McDonell	de'Lisa Bratcher, DOE
-Bill Lawless	Mike French	
-Bill Willoughby	Lee Poe	Joel Cantrell, WSRC
-Murray Riley	James Campbell	Joe Carter, WSRC
-Perry Holcomb		Neil Davis, WSRC
-Karen Patterson		Greg Johnson, DOE
		Kim Hauer, DOE
		Doug Hintze
	Rick McLeod *	
		Mike Johnsen
Regulators		Martin McCrum, WSRC-LW
		Seaward Middleton, DOE
		Dave Olson, WSRC
*CAB Technical Advisor		Sherri Ross, DOE
-WM committee members		Tom Treger, DOE
+Facilitator		Kelly Way, WSRC
^Press		Michile Wilson, WSRC

Harold Rahn called the meeting to order at 5:00. He welcomed those in attendance and asked for introductions. He then introduced the first speaker.

Waste on Wheels-Neil Davis, WSRC
Mr. Davis updated the group on Waste on Wheels (WOW). He told the group that he has been assigned to WOW for the last two years and is in the process of accelerating sludge removal using the WOW process. The first objective for WOW was to reduce the cost for bulk sludge removal by a minimum of 35% with a stretch goal of 85%. Current cost estimates show a reduction of 70%. Once Mr. Davis's team has accomplished bulk sludge removal, they would

turn over the heel removal to the next group. His goals are to drive the cost of bulk sludge removal down to less than $5,000,000 per tank, improve the schedule, and accleterate sludge removal. Mr. Davis said that these goals apply to all tanks, but he plans to focus on the old style tanks first.

He explained that this process is a totally portable and self contained system. This process is different from what has been used in the past because the pumps are submersible. The motor is down in the waste, and the waste is used to cool the motor. There is no rotating, long shaft on these pumps, so these pumps can be used on several tanks before they reach the end of their projected life span. Mr. Davis emphasized that he can use fewer pumps: two in each tank instead of four. In addition, they are floor-mounted versus mounted on the tank top; resulting in less infrastructure. The mixer pumps are controlled from a local resuable control center located near the tank top. These features add up to significant cost savings. In addition, this process recovers the liquid used to slurry the sludge and reuses it to slurry the next batch of sludge; which eliminates the need to add hundreds of thousands of gallons of water to each tank.

Mr. Davis showed photos of the cooling coils in the tanks and explained the challenges they pose for waste removal. He showed a diagram of the WOW equipment and explained the portable substation, the mobile waste removal control center, the slurry pumps, and the transfer pump. Mr. Davis showed a vendor’s assembly drawing of the submersible mixer pump and explained the workings. The pump is submerged. The power goes all the way down to the pump and motor in the tank. Lastly, the transfer pump is designed to be as inexpensive as possible. It is considered to be disposable versus re-usable. However, until there is a resolution on the WIR, no in-tank grouting can take place.

Mr. Davis contrasted the non-WOW and the WOW approach. He contrasted Tank 8 work with the Tank 5 work. The work required to get Tank 8 ready for bulk sludge removal involved significant modifications throughout the entire Tanks 1-8 area. The Tank 5 scope of work "footprint" is much smaller as all the work occurs on or near the tank top. When the sludge has been removed from Tank 5, the equipment can then be relocated to Tank 4.

Mr. Davis outlined the baseline costs from 1999 and the current WOW baseline. He estimates a 70% cost reduction because he can use the equipment again in other tanks. Tanks 5 and 6 can run simultaneously; and they can run off the same power source.

Mr. Davis continued by explaining how the pumps are supported, and how they will stay plumb on the tank bottom. He discussed how the pumps could damage the cooling coils on either side of them and what measures will be taken to lessen the impact. He emphasized that the site has experience with pump discharge forces on cooling coils, and that the failure mechanism would be pinholes or very small cracks in the cooling coils.

When Mr. McDonell asked about sludge solubility in oxalic acid, Mr. Davis explained the work that has been done on acid cleaning. Not all sludge components are soluble in acid; however, the acid reduces particle size and makes the sludge easier to suspend and transfer out.

Mr. McLeod asked about spare pumps. Mr. Davis responded that he had only four pumps and the lead-time on ordering a pump is about 11 months. However, these pumps typically last forty to fifty years.

Mr. Davis covered the schedule for the committee and pointed out that the current forecast is ahead of the Federal Facilities Act plan and schedule. He outlined the key milestones.

Mr. Poe asked about water testing or mock up assembly to test full-scale operation. Mr. Davis pointed out that the first SMP that will be delivered for testing in April would be done at TNX. It will be tested in water, kaolin and sand to simulate actual conditions in a sludge tank.

Mr. Davis told the group there is some risk involved since this is a brand new design and has never been done before. Much of the testing is being done as the equipment is used. Also, can the vendor is struggling with the April 2 delivery date.

Mr. Davis talked about the Hanford site and their interest in the pumps. There has been much information sharing and exchange between sites, which leads to opportunities to save the department money. The Hanford site has used oxalic acid cleaning, and has shared their findings with Savannah River.

The group discussed the pros and cons of acid cleaning; and the tolerance of acid on the DWPF process. Mr. Poe's concern was that this cleaning would weaken the tanks for closure, and he doesn't want to rely on acid cleaning. Mr. Davis noted the concern and interest and offered to come back and brief the committee on those topics.

Annulus Cleaning-Joel Cantrell, WSRC

Mr. Cantrell spoke to the group about plans for annulus cleaning in SRS waste tanks and about Recommendation Numbers 135 and 162. He offered the group some background. He talked about how the safe status of tanks is maintained via the Tank Inspection/Structural Integrity Program, Corrosion Control Program, Tank Fill Limit Program, and routine operational surveillance. Four of the 11 tanks with know leaks have significant accumulations of salt material in the annulus—tanks 9, 10, 14, and 16.

Annulus cleaning is planned in some tanks to demonstrate that final remaining source term supports the performance objective.

Mr. Cantrell stated that SR has done annulus cleaning before in Tank 9 in H-area in the 1958 and 1959 time period. The annulus was flushed with nine batch flushes, which were pumped to the tank primary. The results indicated the Tank 9 annulus material was water-soluble. Tank 16 annulus was cleaned with heated inhibited water solution between June 1977 and March 1978. With heated water solution, most annulus material is water-soluble. Tanks 9, 10, and 14 samples were greater than 90% soluble in water.

Tank 16 annulus material is less soluble in water due to sand blasting debris, which allowed formation of sodium aluminosilicates. This material is partially soluble in oxalic acid. The acid is more capable of leaching nuclides from the material.

Where does this leave us today? Mr. Cantrell referred to a schedule chart and told the group that annulus cleaning is scheduled in tanks that have leaked. A heel removal and annulus cleaning technology development team has been formed to understand the issues. A Consolidated Hazards Analysis Process (CHAP) to determine possible accidents the site could have as a result of heel removal using oxalic acid solution, has been performed. A literature review of chemical cleaning technology has been completed.

The first tanks scheduled for annulus cleaning are Tanks 1,5,6, and 11 in 2006. This is the current plan; however it is impacted by the WIR process. WIR has impacted the site's ability to remove and process salt, as well. DOE has to make the determination that the waste is not high level waste.

Mr. Cantrell laid out for the committee a process map to demonstrate how annulus cleaning would be accomplished. He explained how to prepare the tanks, by converting the existing positive pressure ventilation system to negative pressure, and by installing steam supply, agitation and transfer capability. He then described the cleaning process, which includes humidifying the annulus with steam to remove salt nodules, flushing the annulus pan with water to remove soluble salts, and then introduction of acid for the insoluble solids, and the sampling of the heel to determine the endpoint.

Mr. Lawless asked about the possibility of leaving the annulus material alone.

Mr. Carter answered that this was possible, if it met the performance objective. There are at least four annuli that may not meet the Performance Objective. He reminded the group that SRS has to account to the regulator for any waste left behind. Mr. Cantrell added that the material could be left behind if there were low levels of key radionuclides. All material would have to be characterized. Characterization has been completed on Tank 16, but not on every tank annulus.

Mr. Cantrell closed his presentation by outlining the issues that the group faces. Corrosion-induced hydrogen generation is one issue. As the carbon steel tank corrodes slowly in oxalic acid, the iron could free up electrons that could combine with adsorbed hydrogen in the solution and generate-hydrogen gas. Another challenge is the system planning and integration for salt and DWPF integration.

Mr. Cantrell summarized his talk and assured the group that programs are in place to ensure the safety of tanks. His plan is to use the most current technology available.

Mr. Lawless asked for Public comment.

Bill Willoughby shared with the committee a January 9, 2004, *Science Magazine* article relative to nuclear waste. The article explained work being done in Sweden that is similar to Yucca Mountain. He mentioned that there are many above ground shallow burial and/or storage sites of uranium that contain spent fuel. This is an attractive target to terrorists in airplanes. He added that reactors aren't attractive targets, but the spent fuel sitting next to them are.

Mr. Rahn then adjourned the meeting at 6:50 P.M.