



**Savannah River Site
Citizens Advisory Board**

**Recommendation 220
National Academy of Sciences Interim Report – Tank Waste**

Background

The President signed the National Defense Authorization Act (NDAA) for fiscal year 2005 into law on October 28, 2004. The provision (Section 3146) requires the Secretary of Energy to enter into an agreement with the National Research Council of the National Academy of Sciences (NAS) to "carry out a study of the plans for the Department of Energy to manage waste, from reprocessed spent nuclear fuel, which exceeds the concentration limits for Class C low-level waste " at the three affected sites. The study is to evaluate the DOE's understanding of the "physical, chemical, and radiological characteristics of the waste" and evaluate current plans for monitoring disposal sites to verify compliance with the performance objectives (10 CFR 61).

Congress asked NAS for an interim and a final report addressing this task. According to the NDAA, the interim report "shall address any additional actions the Department should consider to ensure that the Department's plans for the Savannah River Site (SRS), including plans for grouting the tanks, will comply with the performance objectives [of 10 CFR 61] in a more effective manner" (Section 3146 (e) (A)). According to NAS, their second report will address the topic of long-term monitoring for potential releases at SRS from closed tanks and disposed saltstone. NAS issued the interim report on August 5, 2005. Congress requested this study at the same time another provision of the same law (Section 3116) provided the basis for DOE, in consultation with the U.S. Nuclear Regulatory Commission (NRC), to determine that tank wastes at the South Carolina and Idaho sites meeting certain listed criteria are not high-level waste (HLW). Such wastes may then be disposed of on-site (Ref. 1).

In the interim report, NAS made four substantial recommendations (Ref. 2). The first recommendation involved postponing closure of tanks with residual wastes for five to ten years, which would give DOE time to evaluate emerging technologies that could remove more of the residual waste and better immobilize what is left in the tanks. This recommendation urged DOE and South Carolina to decouple the schedules for cleaning the tanks and closing them.

A second recommendation dealt with the amount of compliant tank space available to store waste from ongoing operations at the site, including tank cleanup. Tanks are considered compliant if they have a secondary containment system, so that they are essentially tanks within tanks; noncompliant tanks have no second wall or only a partial one. In this recommendation, it was suggested that DOE should consider other options for preserving or better utilizing its limited compliant tank space, such as setting aside carefully selected nonleaking, noncompliant tanks for emergency storage, or reducing waste streams to compliant tanks, such as redirecting the Defense Waste Processing Facility (DWPF) recycle streams for disposition in the Saltstone Facility.

A third recommendation suggested that DOE and other involved parties should ensure that discussions focus on how radionuclide and chemical quantities and concentrations, their conditioning, their interactions with the environment, and their bioavailability affect site-specific risk. The fourth and final recommendation wanted DOE to fund research and development efforts focused on (1) in-tank and downstream processing consequences of chemical tank-cleaning options, (2) technologies to assist in tank-waste removal, including robotic devices, and (3) studies of the projected near- and long-term performance of tank-fill materials such as grout.

Comment

The SRS Citizens Advisory Board (CAB) agrees with several of the interim report recommendations. The CAB supports the focus on site-specific risk consequences to ensure protection of human health and the environment (NAS recommendation #3) and believes the Performance Assessment is a means

of assessing risk to demonstrate compliance with the performance objectives. It also supports the continued focus on research and development (NAS recommendation #4) as an ongoing mission of the HLW area.

The SRS CAB also agrees with the NAS concept to separate tank waste removal and tank closure actions (NAS recommendation #1). The CAB views the separation as an orderly management action in the regulatory oversight process between SCDHEC and DOE, which should be used to close the tanks as soon as possible contingent on meeting the performance objectives. However, the SRS CAB cannot support waiting on new technologies to be developed. Once the waste determination basis is completed and the performance objective satisfied SRS should determine when waste cleanup is finished using the performance assessment and then can immediately proceed with negotiations with SCDHEC on the tank closure schedule.

A key here is the approval of the waste determination basis for tank closure, which is currently significantly behind schedule. Earlier this month, SCDHEC and the South Carolina Governor's Nuclear Advisory Council (NAC) sent a letter to both DOE and the NRC requesting a meeting to identify and resolve outstanding issues related to closure of the HLW tanks at SRS (Ref. 3). SCDHEC stated in the letter that it is imperative for DOE to aggressively pursue closure of the remaining noncompliant HLW tanks in order to reduce the threat of HLW release. The letter goes on to state that SCDHEC holds enforceable closure schedules for all noncompliant tanks at SRS and the delay in development of the tank closure waste determination basis will clearly impact tank closure dates. SCDHEC mentioned at the 9/27/05 SRS CAB meeting that a new meeting is planned for this October between the three agencies and NRC to resolve these issues. We suggest the agencies make this meeting public and include the SRS CAB. While the SRS CAB agrees with SCDHEC that tank closure is crucial, it believes the optimal risk reductions result in the following priority: (1) salt disposition, (2) bulk removal from the tanks, and then (3) tank closure.

Furthermore, the SRS CAB cannot support the use of noncompliant tanks as a means to increasing much needed tank space (NAS recommendation #2). Experience has shown that this approach cannot be technically justified. Waste has been added to noncompliant tanks (Tank 5 and 6) that did not have a history of known leak sites in the past and within several months of adding the waste to the tanks, additional waste was found in the tank annulus. Subsequent inspections found leak sites that were not there before and waste levels had to be reduced below the leak sites.

The DWPF recycle has been identified by SRS as a potential means to reducing tank waste stream volume but the post evaporation volume of this waste stream compared to other waste streams (sludge wash water) is not significant. In addition, it will take considerable resources and time to design and construct the path for the recycle waste stream to reach Saltstone. The SRS CAB believes the time and resources could be better spent on implementing the deliquification, dissolution, and adjustment (DDA) technology and therefore, does not support this part of NAS recommendation #2. The SRS CAB considers the DDA process essential to tank waste removal and the tank closure process.

Recommendation

The SRS CAB recommends the following:

1. DOE-SR should not wait 5-10 years between tank waste removal and tank closure actions but use the waste determination basis and the performance objective to determine when a tank is clean and ready for closure. DOE should ensure these actions support the FFA schedule.
2. DOE-SR should continue to implement the deliquification, dissolution, and adjustment (DDA) process as long as it remains a viable part of the whole salt waste processing strategy and to minimize any use of noncompliant tanks for waste storage.
3. DOE-SR should demonstrate through performance assessments of the waste disposal system (including assessments of radionuclide and chemical quantities and concentrations, conditioning, interactions and bioavailability) that the SRS plans to dispose of waste and to close tanks at SRS are protective of health, workers, and the environment. The SRS CAB expects DOE-SR to provide annual updates on the waste disposal system performance assessment.
4. DOE-SR should continue to fund research and development and incorporate new technologies

when they become available.

5. By November 15, 2005, DOE-SR provide the current expected timeline for the Waste Determination documents (Salt Determination and Tank Closure) and describe the contingencies for the potential schedule slippage and the expected impacts to the salt waste processing program and tank closure dates.

References

1. Tank Wastes Planned for On-Site Disposal at Three Department of Energy Sites – The Savannah River Site – Interim Report, National Academy of Sciences, August 5, 2005
2. National Academies of Science Tank Waste Planned for On-Site Disposal at Three Department of Energy Sites – The Savannah River Site – Interim Report, presentation to the Waste Management Committee by Doug Hintze (DOE-SR), September 13, 2005.
3. Mr. David Wilson, SCDHEC Assistant Bureau Chief and Mr. Ben Rusche, NAC Chairman, letter on SRS High Level Waste Tank Closure to Mr. Charles Anderson, DOE, Principal Deputy Assistant Secretary for Environmental Management and Mr. Larry Camper, NRC, Director Division of Waste Management and Environmental Protection, September 1, 2005.

Agency Responses

[Department of Energy-SR](#)