SRS Citizen's Advisory Board

Savannah River Site
Citizens Advisory Board

Recommendation 213
Proposed Plutonium Vitrification Facility at SRS

Background
Over the past several years, DOE has made a series of decisions involving the storage and disposition of approximately 50 metric tons of surplus plutonium material. In September 2000, the United States and Russia concluded a surplus plutonium disposition agreement. Under the agreement, both the United States and Russia will each dispose of enough surplus weapons-grade plutonium for thousands of nuclear weapons by fabricating it into mixed oxide (MOX) fuel for commercial nuclear reactors. This approach will convert approximately 34 tons of the surplus plutonium to a form that cannot be readily used to make a nuclear weapon.

In April 2002, DOE canceled the proposed plutonium immobilization project, which was planned to immobilize an additional 16 metric tons of plutonium, thus leaving this plutonium without a disposition path. However, about three metric tons of this surplus plutonium has subsequently been reclassified as programmatic need material, leaving approximately 13 metric tons of surplus plutonium without a disposition path (Ref. 1).

DOE is developing a disposition plan for this excess plutonium that would vitrify it in lanthanide borosilicate glass and dispose of it in Yucca Mountain. As envisioned, DOE-SR would modify an existing facility at SRS by 2012 to vitrify plutonium, and operate it for about 6 years. The facility would apply demonstrated technology for most of its processes. The vitrified plutonium in canisters would be encased in vitrified HLW in the Defense Waste Processing Facility (DWPF) and stored on site for eventual shipment to Yucca Mountain. The plutonium vitrification project is crucial to achieving DOE's strategic goals and the 2025 End State at SRS for EM cleanup activities (Ref. 2).

Comments
The SRS Citizens Advisory Board (CAB) supports the rapid disposition of stored plutonium but is skeptical of the plutonium vitrification facility schedule. The CAB is also concerned about the potential adverse impacts to the HLW vitrification and shipment schedule if plutonium vitrification is coupled with DWPF operations. DOE needs to ensure that the plutonium can be processed without delaying the DWPF schedule. The SRS CAB would like DOE to consider the total quantity of domestic and foreign plutonium that may be processed at SRS when sizing the vitrification facility and scale the facility accordingly. The SRS CAB also wants DOE to investigate options other than co-disposal with Cesium-137 to meet the Yucca Mountain standard as, among other considerations, the potential for additional plutonium from the complex may not be able to be processed with the co-disposal method.

Recommendation
The SRS CAB recommends that DOE:

1. Pursue aggressive funding to complete the design and construction of the Plutonium Vitrification Facility by 2010 or otherwise ensure that the DWPF schedule will not be interrupted.

2. Consider all potential plutonium material within the DOE complex that may be processed in the Plutonium Vitrification Facility, not just the plutonium at SRS, and design a facility capable of vitrifying all potential material by 2018.

3. Investigate options to meet the Yucca Mountain standards other than co-disposal with Cesium-137 from high level waste.

References

1. "Plutonium Storage at the Department of Energy's Savannah River Site – First Annual Report to Congress," Defense Nuclear Facilities Safety Board study, June 2004.

2. Savannah River Site Proposed Plutonium Vitrification Capability, presentation to the NM Committee by Sachiko McAlhany, April 25, 2005.

Agency Responses

Department of Energy-SR