



**Savannah River Site  
Citizens Advisory Board**

**Recommendation 212  
SWPF Confinement System**

**Background**

The Salt Waste Processing Facility (SWPF) is the cornerstone of the Savannah River Site (SRS) salt processing strategy. Of the approximately 84 million (M) gallons (gal) of salt solution that must be processed from the salt waste, approximately 75 Mgal will be processed through SWPF. This facility will be capable of processing 6 to 9 Mgal of salt solution per year after the first year of operation with a nominal annual processing rate of 7 Mgal. SWPF will become operational in approximately 2009 with a planned processing rate of 5 Mgal during the first twelve months of operation. SWPF uses specific processes that have been developed and that will be the state-of-the-art methods to target the removal of Cesium (Cs)-137, Strontium (Sr)-90, and actinides from SRS salt wastes. SWPF will remove approximately 99.998% of the Cs-137/Barium (Ba)-137m (metastable\*) activity while also removing strontium and actinides (Ref 1).

There is a long-standing practice in the design, construction, and operation of nuclear facilities to build-in and maintain structures, systems and components that contain or confine radioactive materials. Unmitigated analysis of the worst case accident scenario for the SWPF reflects that the hazards of this facility are relatively low and that consequences to workers and the public of an extremely unlikely accident scenario are small. Nevertheless, the SWPF design incorporates seismically qualified passive primary (piping and tanks) and secondary (central process area cell walls) confinement features that are credited as safety related for worker protection. The facility also has (as added defense in depth) an active confinement ventilation system although it is not considered necessary to assure worker or public safety, and thus is not credited as safety related. The Defense Nuclear Facilities Safety Board (DNFSB) has indicated that Passive confinement systems are not necessarily capable of containing hazardous materials with confidence because they allow a quantity of unfiltered air contaminated with radioactive material to be released from a nuclear facility following certain accident scenarios. Further, the DNFSB indicates that safety related active confinement ventilation systems will continue to function during an accident, thereby ensuring that radioactive material captured by filters before it can be released in to the environment (Ref. 2).

On August 27, 2004, the DNFSB sent a letter to the Department of Energy (DOE) regarding their concerns about the DOE standards that govern the confinement approach used for SWPF design. The confinement concept for SWPF is based on the isolation of the facility using passive confinement during accident scenarios, in particular, during seismic activity. DNFSB also suggested that the SWPF should be designed with a safety-related active ventilation system (Ref. 3).

**Comment**

The Board agrees that the confinement system for the SWPF must assure that the safety of the worker, the public and the environment is maintained. Changing the standards applied to the seismic and confinement system design of the SWPF is likely to result in delays that could potentially slow SWPF startup by up to 16 months and significantly increase its costs, as reported by SRS. The SRS Citizens Advisory Board (CAB) would very much like to see the schedule for SWPF be accelerated and by no means delayed. However, the SRS CAB is concerned that any decision to modify the safety standards to require additional seismic design considerations and crediting of the existing active confinement ventilation system as safety related may jeopardize this objective. Both DOE and DNFSB need to consider the risk of modifying the design of SWPF versus shutting down the high-level waste (HLW) program. Any delay in the SWPF schedule must be justifiable using technical merit and funding availability and include an analysis of the overall impacts to the HLW system.

**Recommendation**

The SRS CAB recommends the following:

1. DOE-SR work with the DNFSB to expeditiously resolve the SWPF confinement system issues based on technical merit, risk impact to the overall SRS waste management system, and cost benefit analysis of various options.

2. By July 26, 2005, DOE-SR provide an estimate of the relative risks of postponing the treatment of high-level wastes and closing HLW tanks in a HLW system operating with 50-year old tanks and infrastructure compared with the risks of not upgrading SWPF.
3. DOE-SR review the open issues related to the SWPF confinement system with the Citizens Advisory Board's Waste Management Committee at the committee's June meeting.

**References**

1. Draft Section 3116 Determination for Salt Waste Disposal at the Savannah River Site February 28, 2005.
2. Recommendation 2004-2 letter from John T. Conway DNFSB Chairman to the Honorable Spencer Abraham, Secretary of Energy, December 7, 2004
3. Confinement Approach letter from John T. Conway DNFSB Chairman to the Honorable David K. Garman, Under Secretary of Energy, August 27, 2004

\* Metastable – Designating a relatively unstable, transient, but significant state of a physical or chemical system, as of a supersaturated solution or an energetically excited atom.

**Agency Responses**

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