**Savannah River Site**
**Citizens Advisory Board**

---

**Recommendation # 287**
Disposition Planning and Dry Storage of Spent Nuclear Fuel

## Discussion

The receipt of Spent Nuclear Fuel (SNF) from foreign and domestic research reactors is an ongoing program at Savannah River Site (SRS) and has been for many years. Current planning indicates that such shipments will continue for a number of years in the future. Much of the spent nuclear fuel has Highly Enriched Uranium (HEU).

These HEU material receipts will be stored in the L-Basin pool, built in 1956, along with some 14 metric tons of existing used fuel assemblies (1,500+) that began arriving in the facility in 1996 as part of the National Nuclear Safety Administration's Global Threat Reduction Initiative. Current rack positions in the L-Basin pool are approximately 90 percent full and future receipts of domestic and foreign fuel will require costly re-racking (tens of millions of dollars).

According to SRS management (CAB presentation 3/29/11), rack capacity for Material Test Reactor (MTR) units is 15,515 with 12,540 filled. High Flux Isotope Reactor (HFIR) capacity is 120 with 117 filled. A total capacity of 17,015 MTR racks and 220 HFIR racks is proposed. An additional 1100 racks are proposed for Canadian National Research Universal/National Research Experimental (NRU/NRX) receipts. All told, an additional 4,884 assemblies have been identified for shipment to South Carolina.

It is not clear at this point how this SNF will be ultimately dealt with from a disposition standpoint. The decision on how to proceed in this matter is part of the larger picture on how DOE will dispose of such SNF in light of the Blue Ribbon Committee Report recommendations issued in January 2012. The Citizens Advisory Board has expressed strong support for processing the SNF through H-Canyon to recapture the remaining HEU for reuse in nuclear power plants and processing the waste in the Site Liquid Radioactive Waste Program, which is a well-established and controlled disposition pathway.

## Comments

At this point there is no disposition path for the SRS spent nuclear fuel.

Public safety and worker risks increase with additional receipts of HEU materials for L-Basin. L-Basin already has 36 cans of 50-year old spent nuclear fuel (SNF), some contained within corroded and leaking containers which originated from the world's first nuclear core meltdown in the 1950s. Some containers have vulnerabilities for long term storage. Three have ruptured due to excessive fuel corrosion which caused high cesium-137 contamination within the containers and uranium fuel in one can is so corroded that it left 36 kilos of oxide sludge at the bottom of the container. Some of these containers have not been inspected by the Department of Energy (DOE) since they were packaged decades earlier.

The CAB is aware that the FY 2012 budget does incorporate plans to process a portion of the SNF (the most vulnerable at-risk SNF) through H-Canyon and we strongly support processing all of the SNF in L-Basin that can be processed through H-Canyon.

The initial disposal plan for processing the L-Basin nuclear waste materials was to use a "melt and dilute" process which was cancelled due to high costs. In 2000, the designated backup plan was processing the materials through H-Canyon for disposal. This plan has also not been initiated. H-Canyon is the only

hardened nuclear chemical separations plant still in operation in the United States. The H-Canyon and its experienced personnel can also process certain types of plutonium, HEU, and aluminum-clad foreign and domestic SNF for disposal.

From our discussions with DOE we have been advised many times that the SNF can be stored in the present configuration of underwater storage safely for greater than 50 years. The tone of these discussions seems to indicate that DOE is prepared to accept long term SNF storage.

The CAB would like to express a degree of urgency on two counts:

1. SNF Disposition Pathway- SNF should not be brought into the Site on a continuing basis without some disposition pathway being established in the reasonably near future. If H-Canyon is to be used then the SNF processing needs to be meshed into the final stages of the Defense Waste Processing Facility schedule. If H-Canyon is not feasible or affordable some other disposition scheme should be developed and publicized. Bringing nuclear waste into the Site without a disposition plan reflects poorly on DOE planning.
2. SNF Dry Storage- If DOE determines that long-term storage plans (on the order of 50-year storage) for the SNF is necessary then the CAB feels that the Dry Storage option should be assessed. Extended underwater storage offers the increased vulnerability of SNF corrosion and water chemistry control and the potential loss of the water shielding during certain events. Dry storage assessment may offer some extended storage options.

**Recommendations:**

The Savannah River Site Citizens Advisory Board recommends that DOE:

1. Continue to disposition all research reactor spent nuclear fuel stored in L-Basin using the H-Canyon and considering the highly enriched uranium which can be utilized by the private nuclear power industry.
2. Assess the status of SNF disposition planning and advise the CAB when disposition plans can be developed for both SNF presently at SRS and the remaining SNF yet to be received.
3. Assess the feasibility of SNF dry storage and advise the CAB which if any of the SNF should be placed in dry storage with an emphasis on SNF slated to remain at SRS in an extended storage configuration.

Recommendation # 287
Adopted May 22, 2012
Sponsored by the Nuclear Materials Committee