

Recommendation #271
Finalize the Plan for Plutonium Disposition

Background:

Plutonium storage and disposition at the Savannah River Site (SRS) has been an active and ongoing program for many years dating back to the mid-1990s. In November 1999, the Department of Energy (DOE) issued the Surplus Plutonium Disposition Final Environmental Impact Statement followed by a Record of Decision in January 2000 which indicated a decision to dispose of up to 50 metric tons (MT) of plutonium using a dual approach of: 1) immobilizing plutonium in a ceramic form in a can followed by insertion in a Defense Waste Processing Facility (DWPF) canister (can in canister approach) for ultimate disposition in a federal repository; and 2) utilizing the plutonium in a mixture with uranium fuel (Mixed Plutonium-Uranium Oxide) for irradiation in existing domestic commercial reactors. (MOX Facility at SRS will fabricate the mixed oxide fuel).

For a number of years this approach has been the subject of much scrutiny, delays, and some budget constraints. In December 2003, the Defense Nuclear Facilities Safety Board urged DOE to “Expedite the development of a complete, well-considered plan for the disposition of all excess plutonium to preclude unnecessary extended storage of plutonium at SRS.” In response to this recommendation DOE indicated plans to build a vitrification facility at SRS for up to 12.8 MT of plutonium. Plans for this facility seemed to be on track in October 2006. However, in July 2008, DOE indicated that budget studies favored elimination of the vitrification facility with the low quality plutonium being dispositioned via processing of the plutonium in normal waste processing streams of H-Canyon (for disposition in DWPF canisters).

While the MOX facility, the other aspect of plutonium disposition, has experienced some delay, that facility was funded and construction began in August 2007. In the 2008-2009 timeframe plans for plutonium disposition seemed to focus on processing approximately 7.8 MT more of the plutonium through the MOX facility and reducing the waste stream through H-Canyon to approximately 5 MT.

However, in January 2009, DOE indicated a potential problem with the use of the planned waste streams through H-Canyon (and the DWPF canisters) since the proposed licensed plutonium load limit for DWPF canisters was 897 grams/cubic meter for disposal in a federal repository. At this loading limit there may not be enough DWPF canisters to contain the non-Moxable plutonium.

DOE then undertook yet another extensive, and no doubt expensive, study of this issue which considered such options as variation of plutonium loading in DWPF canisters and potential disposition of plutonium to the Waste Isolation Pilot Plant (WIPP). As this study in a series of studies was underway two other variables were introduced: 1) The Yucca Mountain Federal Repository designation was cancelled by the President (loading limits for Yucca Mountain would possibly no longer be a consideration); and 2) A question was raised on whether to process Spent Nuclear Fuel at SRS (which permits processing the low quality plutonium at the same time as feed input stream) or not to process Spent Nuclear Fuel at all. H-Canyon is the only facility in the United States capable of processing aluminum clad Spent Fuel. Without a Federal Repository the Spent Fuel would likely be stored at SRS for an indefinite period of time. If the Spent Nuclear Fuel at SRS is not processed then the cost of plutonium disposition would be much more expensive, since all H-Canyon processing costs would be borne by the plutonium disposition process alone.

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In January 2010, the CAB was advised that these studies were nearing completion with HQ approval pending.

The citizens of SC have made it clear that SRS is not to be a Site for long-term storage of plutonium. A former governor of SC threatened to have the SC state troopers stop all shipments of plutonium into the state of SC unless the state could be assured by DOE that there was a good faith plan in place to remove the plutonium from the site in a reasonable amount of time. The plutonium disposition plan was due to Congress by February 1, 2002. The plan was submitted to Congress on February 15, 2002 with a supplemental plan submitted on September 5, 2007.

Public Law 107-107, dated December 28, 2001, Section 3155 stated that the Secretary of Energy prepare a plan for the disposal of surplus defense plutonium and defense plutonium materials currently located at the Savannah River Site and for disposal of defense plutonium and defense plutonium materials to be shipped to the Savannah River Site in the future. The plan shall include: 1) A review of each of the disposal options. 2) An identification of the preferred option for disposal. 3) A specification of the means by which all defense plutonium and defense plutonium materials will be removed in a timely manner from the Savannah River Site for storage or disposal elsewhere. Public Law 107-107 states that if the Secretary of Energy does not submit to Congress the Plan for Plutonium Disposition by February 1, 2002, the Secretary shall be prohibited from shipping defense plutonium or defense plutonium materials to the Savannah River Site until the Plan is submitted to Congress.

Finally, a key component of the plutonium disposition program at SRS is the storage of DWPF canisters containing plutonium at a federal repository. The Nuclear Waste Policy Amendment in 1987 named Yucca Mountain as the reference site for the nuclear waste federal repository. This federal repository has been funded by the rate payers of SC at a rate of one mill per kilowatt-hour (Nuclear Waste Fund). Recently, the current Administration rejected the use of the Yucca Mountain site in the 2010 and 2011 Federal budgets. However, the Nuclear Waste Policy Act is a federal law and is not cancelable by the President or the Secretary of Energy. The States of South Carolina and Washington are challenging the actions by the current administration.

Comments:

It is clear from the above background discussion that the matter of how to disposition the plutonium is very complex with many ramifications, economic, technical and political. However, this decision process has exceeded 10 years which the CAB considers unacceptable. During this time the technical options have changed; the can in canister option being discarded and funding for the federal waste repository being cancelled. With all of these shifting bases, having some aspects of this plutonium disposition program finalized would be a definite step toward final resolution.

Furthermore, it would help to establish the design bases for the entire program. We are aware that the MOX facility is being constructed and readied for operation by 2016 and that additional facilities are needed to prepare the plutonium now in storage in K Area (along with other plutonium from weapon pits) for processing in the MOX facility. It makes sense to commit to the feed streams to the MOX facility in an early and timely manner.

In addition, concerned stakeholders would like to be assured that finally a definite path forward for the disposition of this plutonium has been decided. While the issue of where to dispose DWPF canisters may be uncertain, the decision should at least be made and stated regarding what plutonium has to be placed in canisters and what material should be processed through the MOX facility.

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The thrust of this recommendation is to voice our dismay at the decision-making process which has resulted in many abandoned plans and no comprehensive decision in 10 plus years, and to make sure that DOE understands that the CAB strongly encourages that the plutonium disposition issue be resolved before another year passes.

Reference List of Previous Recommendations Related to Plutonium Disposition

1. #266 Enriched Uranium Disposition, 9/29/09
2. #263 Final Disposition for Spent Nuclear Fuel, Surplus Plutonium, and Vitrified High Level Waste, 5/19/09
3. #250 Plutonium Consolidation Consequences, 11/27/07
4. #246 Supplemental Environmental Impact Statement for Surplus Plutonium Disposition at SRS, 5/22/07
5. #243 Plutonium Vitrification Facility 4/17/06
6. #213 Plutonium Vitrification Facility 5/24/05
7. #223 Plutonium Consolidation – GAO Report, 9/27/05
8. #214 Plutonium Disposition Options, 5/24/05
9. #196 Plutonium Shipments and Disposition, 7/28/04
10. #188 Plutonium Disposition, 3/24/04
11. #170 EM Owned Plutonium Storage and Disposition at SRS, 9/23/03
12. #61 Draft Surplus Plutonium Disposition Environmental Impact Statement, 7/28/98
13. #30 Plutonium from Rocky Flats to SRS, 1/28/97

Recommendation:

The Savannah River Site Citizens Advisory Board (SRS CAB) recommends that DOE:

1. Advise the CAB by July 2010 when DOE will have an approved final plan for the disposition of all said plutonium currently stored or still expected for arrival at the SRS in order to preclude unnecessary and unacceptable extended storage of excess plutonium at SRS.
2. Advise the CAB of the schedule impact, if any, that the disposition plan will have on other DOE-SR EM programs and plans, and the incremental cost associated with the approved plan.