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Recommendation 364  
Accelerated Deactivation and Decommissioning of 235-F

Work Plan Topic

<b>Topic 2</b>	<b>Work Plan Item:</b>	<b>235-F Deactivated State</b>
	Description:	235-F removal of Plutonium 238 is occurring to place this facility into a deactivated state. Options exist for the final end state of this facility exist and will be provided by DOE EM in a briefing.  From a community perspective, provide a recommendation to EM SRS as to the option, from those presented or an alternate developed by the CAB, that would best serve the environmental concerns of the community
	Recommendation Deadline:	May 2019

Background

Building 235-F was constructed in 1950s as part of the original Savannah River Site (SRS) Project to support US Defense Programs. The facility went online or “hot” in the 1950’s. The building is a large building with dimensions of 222 feet by 109 feet with blast resistant hardened walls 14 inches thick.

This facility served several missions during its operational life. The original mission was to process Pu 239; however, this mission was canceled prior to the installation of equipment. The next missions were the Actinide Billet Line (ABL), Plutonium Experimental Facility (PEF), and Plutonium Fuel Form (PuFF), including the Metallography Laboratory (ML)<sup>1</sup>.

In 1970, the mission was slightly modified and reconfigured, and the ABL process was truncated to support PuFF; this process created Pu 238 pellets as fuel sources for NASA space missions. This process was done in a series of glove boxes (Cells 1 – 5 East Line & Cells 6 -9 West Line)<sup>1</sup>. Although the program was highly successful, the process was a dirty process as the first steps in Cells 1 & 2 consisted of ball milling (grinding) Pu 238 which produced dust and particles the size of one micron (average human hair is 40 – 50 microns). The cells are contaminated with a Pu 238 dust that covers much of the interior of the cells. The largest percentage of dust is in Cells 1 & 2.

In the early 1990’s all processes were shut down – this shut down has been described as everyone leaving one day, cutting off the lights, and never returning. In 2006, the storage vault for the nuclear materials was emptied, and the building was placed in a surveillance and maintenance mode.

As Pu 238 is corrosive the intervening years have left the manipulators corroded to the point of being inoperable, the glass shielding with algae buildup makes the interiors of the cells almost invisible, and cells are highly contaminated with Pu 238. Concerns exist that in a full fire event in 235-F or a seismic event, Pu 238 could be released. Studies show that in the worst case, a

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<sup>1</sup> Clendenning, R.J., 2019, “Overview and Status Update of the Savannah River Site, Building 235-F Risk Reduction Project”

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seismically induced full facility fire scenario, the calculated unmitigated dose would be 11,900 rem to personnel within 100 meters, far exceeding the standard of 100 rem. In 2012 the Defense Nuclear Facilities Safety Board (DNFSB) issued Recommendation 2012-1 to address the Pu 238 to either remove or immobilize the material to achieve the 100 rem standard<sup>2</sup>. This plan was implemented, and work continues at this time. Under the current plan, once the Pu 238 is removed (as much as is possible) the building will be placed in a ‘cold and dark’ status defined as no active structures, systems and components. However, the building will have to be monitored and ventilated until final decommissioning occurs in the 2040 timeframe.

This facility was incorporated in the Federal Facility Agreement (FFA) in Appendix K (D&D Facilities List). Current FFA Appendix E schedules milestones for F-Area<sup>3</sup>. The timeline for decommissioning this facility is: (a) Interim Record of Decision (ROD) in 2026, (b) Interim Remedial Actions (RA) starts 2028, (c) Final ROD 2039, and (d) Final RA start 2040<sup>4</sup>.

### Options

As the current plan to maximize removal of Pu 238 as well as all combustibles in the building that is achievable while maintaining monitoring, the question arises as to path forward. There are two major options to consider:

1. Continue the current path and maintain the building for 20 years and then deactivate and decommission the building at that time.
2. Alter the current plan and seek regulatory approval to decommission the building while highly trained and skilled workers are available (these employees will likely be retired under the current time lines necessitating another workforce to be trained) and continue a new path forward with deactivating the building and decommissioning the building to be complete by 2026.
  - a. Acceleration offers the following advantages:
    - i. Risk Reduction: the sooner the facility is stabilized and sealed, the fewer hazards it will present to both workers at SRS as well as the citizens of neighboring communities;
    - ii. Workforce Availability: A trained workforce is available now to initiate the process of decommissioning but may not be in the future;
    - iii. Worker Safety: Halting Pu 238 removal activities as soon as the material can be safely entombed will reduce the risk to workers within the building;
    - iv. Reduced Costs: Reduce surveillance costs of the deactivated facility; and avoid likely cost increase from delayed decommissioning. The annual cost for surveillance could reach millions of dollars (for 20 years before decommissioning work is scheduled to begin) to maintain the building in a safe state can be eliminated; and

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<sup>2</sup> Hasty, Jeff, 2019, “Overview and Status Update of the Savannah River Site, Building 235-F Risk Reduction Project”

<sup>3</sup> WSRC OS 94-42, 1993,” Federal Facility Agreement for savannah river Site, Administrative Document Number 89-05-FF”.

<sup>4</sup> Hennessey, 2019, “Facility Decommissioning under the SRS Federal Facility Agreement” (Panel -235-F Closure Activities).

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- v. That the cost of the work in today's dollars will result in huge potential savings to the public, the ultimate "financiers" of all projects at SRS.

Recommendation

The Citizens Advisory Board (CAB) recommends that the Department of Energy:

1. Accelerate the timeline for decommissioning 235-F with a targeted completion date of 2026 and;
2. Initiate the preparation of required regulatory documents in parallel with the deactivation process.
  - a. These documents may include the preparation of an Engineering Evaluation Cost Analysis (EECA), Remedial Investigations (RI) for Remedial Actions (RA), Interim ROD Feasibility Studies (FS) for decommissioning design, Interim ROD, Start Decommissioning Implementation plans, and budgets.
  - b. Parallel preparation of the required regulatory documentation will help complete the decommissioning of the facility a number of years ahead of the proposed FFA schedule and offer what is considered the most cost-effective option.