Spent Fuel Project Overview

Nuclear Material System Plan

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The SRS Citizen’s Advisory Board (CAB)
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L Area (105-L)-History

- L-Reactor was a production reactor that was used for the safe production of special nuclear material.

- It began operating in the 50s and was shutdown in 1968 when production capability was no longer needed.

- The Reactor restarted in 1985 and shutdown again in 1988. The restart led to the choice of the Phoenix as the area’s symbol.

- The building is approximately 350 ft. long x 275 ft. wide. It extends 40 ft. below grade and 149 ft. above grade.
Spent Fuel Project (SPF) - Current Missions

Non-Proliferation

– Receive and store aluminum-based spent nuclear fuel from Domestic Research Reactors (DRR) and Foreign Research Reactors (FRR) from civilian sites
  • Spent Nuclear Fuel stored in L Area basin

Support disposition of Spent Nuclear Fuel

• Package and ship High Flux Isotope Reactor (HFIR) and Material Test Reactor (MTR) fuel to H Canyon for dissolution
L Area Spent Fuel Basin

- 3.4 million gallon basin with depths of 17 feet to 50 feet
- Standard storage configuration for spent fuel
  - Expanded Basin Storage (EBS) racks store MTR Fuel
  - HFIR racks store HFIR Fuel

Safety

✓ Fixed geometry for criticality control
✓ Racks seismically qualified for design basis seismic event
✓ No active cooling required
## L Area Spent Fuel Basin Storage

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Total Approved Positions</th>
<th>Positions Filled</th>
<th>Positions Available</th>
<th>Percent Filled (rounded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Fuel Storage 1</td>
<td>16</td>
<td>16</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Dry Fuel Storage 2</td>
<td>27</td>
<td>23</td>
<td>4</td>
<td>85%</td>
</tr>
<tr>
<td>Oversized Can Racks</td>
<td>42</td>
<td>23</td>
<td>19</td>
<td>55%</td>
</tr>
<tr>
<td>Bucket Racks</td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>100%</td>
</tr>
<tr>
<td>Bucket Row Storage</td>
<td>33</td>
<td>17</td>
<td>16</td>
<td>52%</td>
</tr>
<tr>
<td>EBS</td>
<td>3650</td>
<td>3231</td>
<td>419</td>
<td>89%</td>
</tr>
<tr>
<td>HFIR (Cores)</td>
<td>120</td>
<td>102</td>
<td>18</td>
<td>85%</td>
</tr>
</tbody>
</table>

- **Fuel assemblies**
- **Loaded bundle ready for storage**
- **HFIR Core**
- **3-D photo of HFIR racks**
Forecast Future Fuel Receipts

- **Foreign Research Reactors (FRR)**
  - Authorized by the National Environmental Policy Act (NEPA) through May 2019
  - DOE processing Amended Record of Decision (AROD) hardship extension through 2029 for Japan
    - Approximately 250 bundles
    - Approximately 30 casks

- **Domestic Research Reactors (DRR)**
  - Authorized by the NEPA through 2035
  - Approximately 15 bundles per year
  - Approximately 12 HFIR cores per year
  - Approximately 20 casks per year

![Battelle Energy Alliance Research Reactor (BRR) Cask](image)
Fuel Disposition – HEU Blenddown

Amended Record of Decision (AROD):

• Savannah River Site Spent Nuclear Fuel Management Environmental Impact Statement (EIS) amended March 2013

• Approximately 3.3 MTHM of aluminum based high enriched uranium (HEU) fuel to be processed in H Canyon
  ❖ Targeted completion FY2024
  – Approximately 1000 fuel bundles (Approximately 250 Processed)
  – Up to 200 HFIR cores (Approximately 25 Processed)

• Avoids installation of additional fuel storage racks

• Supports anticipated future foreign & domestic fuel receipts

• Down blend HEU to LEU; available for use in commercial power reactors
Nuclear Materials Plan for HFIR

L-Basin HFIR Storage Capacity, Receipts, Canyon Processing

Current HFIR Capacity 120

FY2024: Complete AROD processing 200 HFIR Cores

HFIR In / HFIR Out

HFIR Rack Positions Filled

PRE-DECISIONAL DRAFT
FY2020 Funding Impact to Nuclear Materials Plan for HFIR

L-Basin HFIR Storage Capacity, Receipts, Canyon Processing

Current HFIR Capacity 120

FY2025: Complete AROD processing 200 HFIR cores

PRE-DECISIONAL DRAFT
Nuclear Materials Plan for MTR Fuel Bundles

L-Basin Expanded Basin Storage Capacity, Receipts, Canyon Processing

FY2024: Complete AROD processing of 1000 bundles

PRE-DECISIONAL DRAFT
Summary

• SRS continues to safely receive and store spent nuclear fuel to reduce global threat

• Foreign fuel receipts continue to 2029 (Pending AROD)

• Domestic fuel receipts continue to 2035 (Current NEPA)

• SNF inventory being dispositioned as directed by DOE-EM AROD
  • H Canyon processing to reduce risks, avoid costly storage expansion, beneficial reuse of U-235
  • Approximately 1000 MTR fuel bundles (approximately 250 processed)
  • Up to 200 HFIR cores (approximately 25 processed)