U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

SRS Spent Nuclear Fuel Program Update

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CAB
Savannah River Site Citizens Advisory Board

Agenda

SRS Spent Nuclear Fuel (SNF) Program Update

- Mission
- L Basin Overview
- L Basin Storage
  - Wet
  - Dry
  - Capacity Rollup
- Cask Processing
- Receipts
- Shipments
- Recent Accomplishments
- Summary

L-Area Facility

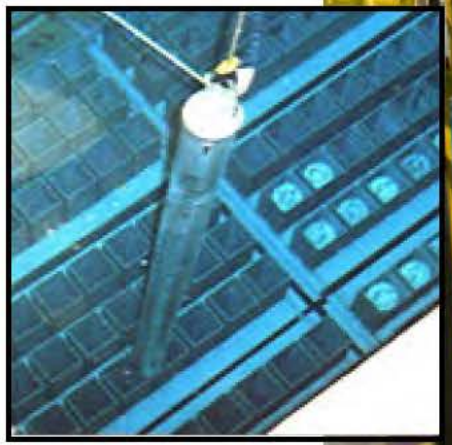
SRS Spent Fuel Program Mission

- Receive and store aluminum-based SNF from foreign & domestic research reactors
- Support National Nuclear Security Administration's (NNSA) nonproliferation effort for removal of Highly Enriched Uranium (HEU) from reactor sites (~34 Foreign Countries)
- Support Office of Nuclear Energy and the Office of Science ongoing reactor programs (~5 Domestic)
- Store legacy SRS nuclear materials
- Package and ship fuel for disposition

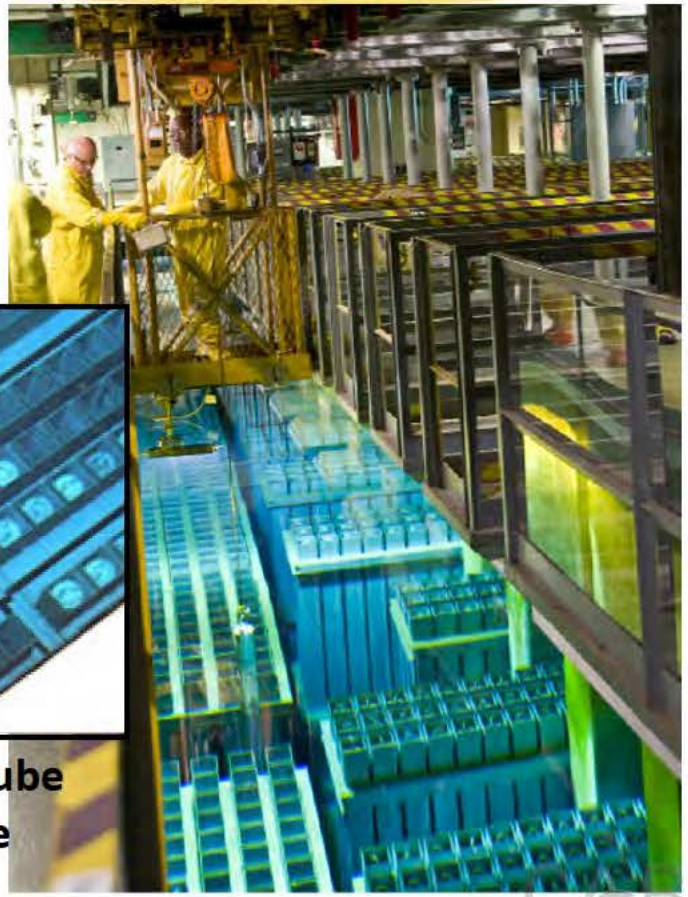
L-Basin

L-Basin Overview

- Steel-reinforced concrete structure
- Approximately 3.4 million gallons of water
- Pool depth of 17’ to 50’
- Water provides shielding for worker safety
- No active cooling
- Systems to maintain water level, clarity, and purity
- Storage configurations include:
  - Expanded Basin Storage (EBS) Racks
  - High Flux Isotope Reactor (HFIR) Racks
  - Oversized Can (OSC) Racks
  - Bucket Storage Racks
  - Bucket Storage Rows



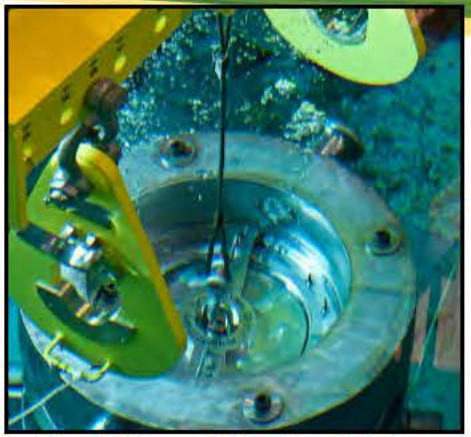
Vertical Tube Storage



L-Basin

Example Cask Processing

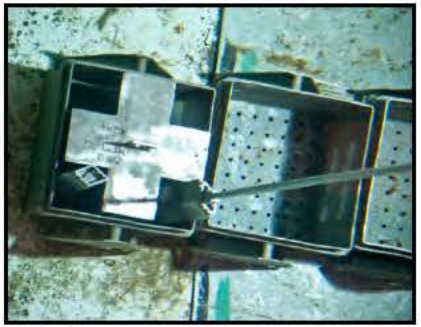
Receive Cask/
Removed Impact Limiters



Cask Placed Under Water

Lid Removed

Cask with fuel ready for verification

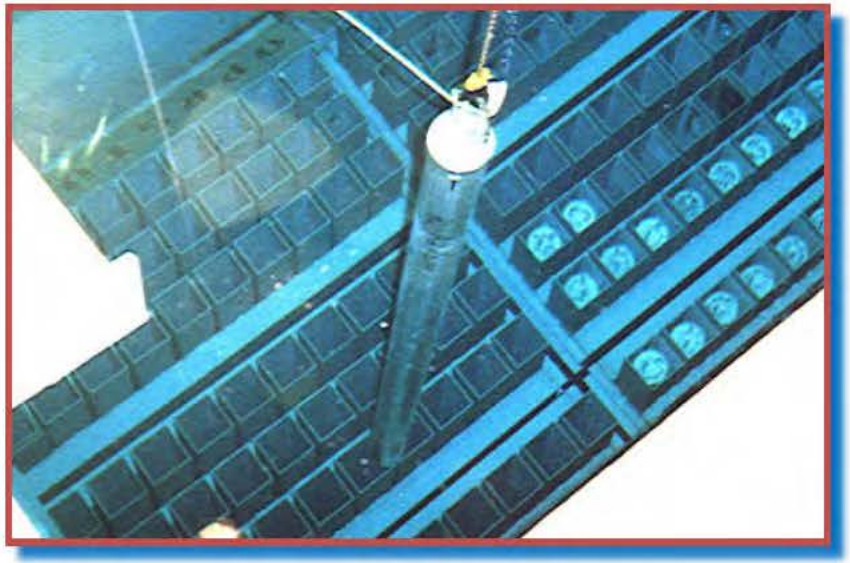


Fuel Removal & placed in bucket for transfer to Basin from Transfer Bay

Decon, Reassembly & Ship Empty Cask

L Area Basin Storage

- **Expanded Basin Storage (EBS) Racks**
  - Fixed geometry for criticality control
  - 3650 positions
  - 3156 occupied
  - Space to add more racks if needed



Fuel bundle being lowered into storage rack

L Area Basin Storage

- **HFIR Racks**
  - 120 positions
  - 71 occupied
- **Bucket Storage Racks**
  - 36 positions
  - 4 occupied
- **Oversize Can (OSC) Racks**
  - 42 positions
  - 23 occupied
- **Bucket Row Storage**
  - 39 positions
  - 26 occupied

HFIR Core

OSC Rack

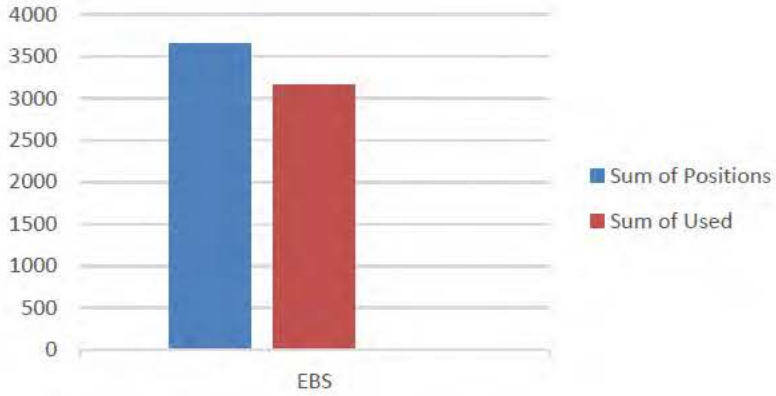
L Area Dry Fuel Storage

- **Disassembly Area Dry Fuel Storage Area**
  - 23 Drums (full)
- **Slug Vault Dry Fuel Storage Area**
  - 16 Drums (full)

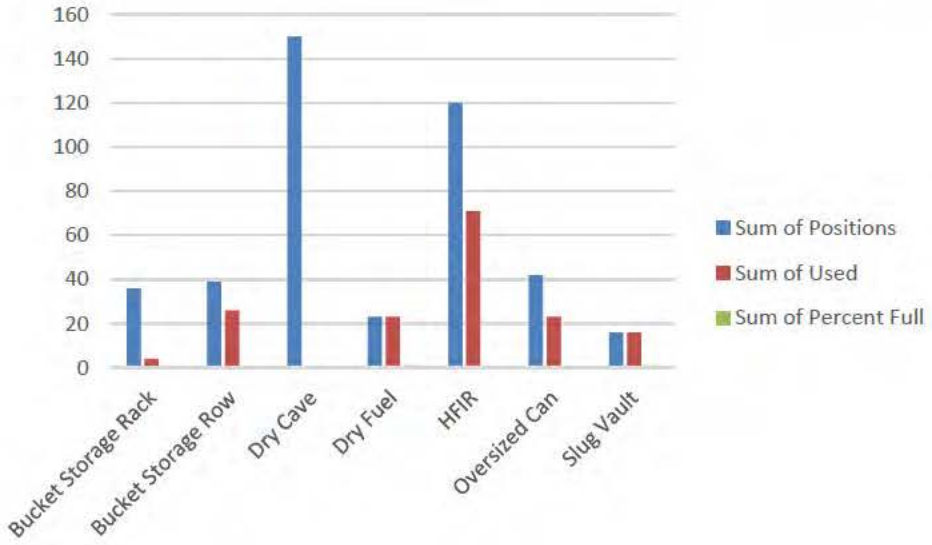
Pacific Northwest National Laboratory (PNNL) Drums (55 gal)

Mound Drums (30 gal)

L-Basin Capacity Rollup



Type	Positions	Used	Percent Full
Slug Vault	16	16	100%
Oversized Can	42	23	55%
Dry Fuel	23	23	100%
Bucket Storage Rack	36	4	11%
Bucket Storage Row	39	26	67%
EBS	3650	3156	86%
HFIR	120	71	59%



Spent Fuel Cask Examples

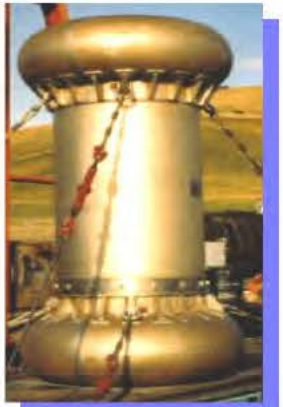
TN-7/2

JRF-90Y-950K

LWT

JMS-87Y-18.5T

BRR



GE-2000

JRC-80Y-20T

Fuel Receipts

- **FY23 Receipts**
  - Foreign Research Reactors: 2 casks / 12 assemblies
  - Domestic Research Reactors: 18 casks / 64 assemblies & 12 HFIR cores
- **FY24 Forecast Receipts**
  - Foreign Research Reactors : 5 casks / 134 assemblies
  - Domestic Research Reactors : 16 casks / 32 assemblies & 12 HFIR cores

← BRR Cask

GE2000 Cask →

Fuel Shipments

FY23 Shipments (casks)

Material Test Reactor Fuel: 3

HFIR: 10

- **FY24 Forecast Shipments (casks)**
  - Material Test Reactor Fuel: 16
  - HFIR: 3
  - Mark 18 A Target: 3

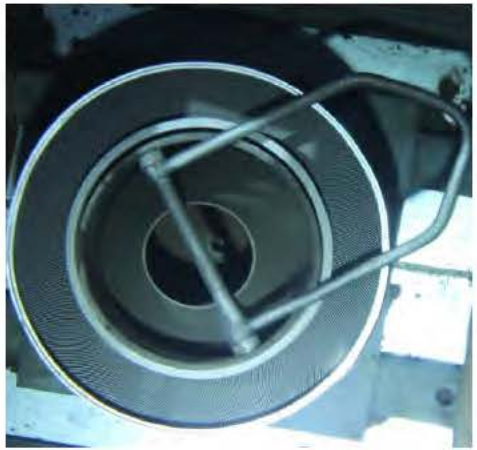
SRS 70-Ton Cask →

Recent Accomplishments

1) HFIR Cleaning
   - 1996 Deionizer install
   - Resin cannot be dissolved
   - 5 years of Resin discharge
   - 60 cores/5 Rows
   - 2023 Completion

2) Roof Replacements
   - ~20 years old
   - Leaks caused by failed roof
   - FY23 Bldg 704, 910/911

Before



After

Recent Accomplishments

3) Augmented Monitoring and Condition Assessment Program (AMCAP)
   - CAB recommendation early 2000's
   - Supports ABD by Identifying challenges
   - Helps identify early signs of container degradation for legacy SNF

4) Idaho National Lab (INL) Drum Venting
   - 2007/8 Drums arrive
   - 2018 Calculation Identified possible issues
   - Jun 2023 mitigation IAW local procedures
   - Added ~100 years of safe storage.

Before

After

Summary

- Mission
- L Basin Overview
- L Basin Storage
- Cask Processing
- Receipts
- Shipments
- Recent Accomplishments
- Department continues to safely receive and store SNF to reduce global threat.
- Basin annual inventory volume will continue to decrease in support of ABD