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Foreign and Domestic Spent Fuel Shipment Receipts at Savannah River Site

Kiran Karanth

Program Manager, Fuel Receipt Programs
Savannah River Site (SRS)

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M3's Office of Nuclear Material Removal: Less is More





Convert

Convert research reactors and isotope production facilities to non-weapons-useable nuclear material both domestically and abroad

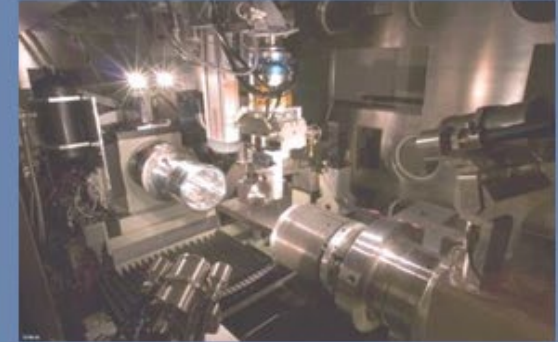
- Research Reactor Conversion
- Mo-99 Production



Remove

Remove or confirm the disposition of excess weapons-useable nuclear material at civilian facilities across the globe and consolidate those materials that remain

- International Nuclear Material Removal and Consolidation
- International Nuclear Material Down-blending

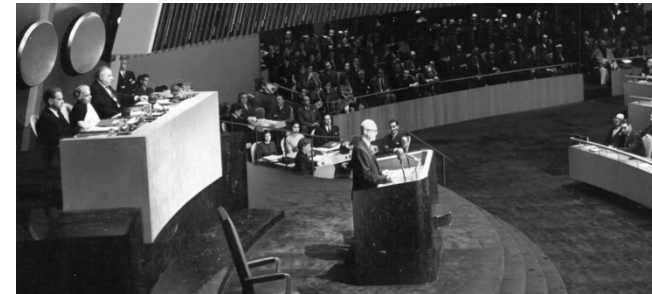


Dispose

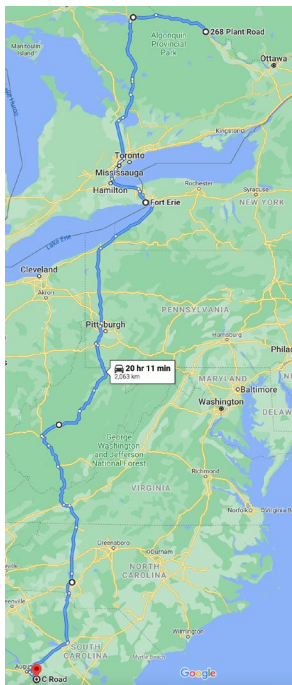
Dispose of and manage excess weapons-useable nuclear material, from both domestic stockpiles and material returned from abroad

- HEU and Plutonium Disposition
- Uranium Supply for Peaceful Uses

- The beginning, President Dwight D. Eisenhower's 1953 "Atoms for Peace" speech launched a new era of peaceful nuclear energy cooperation
- It also paved the way for the export of nuclear technology, including research reactors and nuclear materials
- Foreign Research Reactor return Program will end in FY-29, receipts from Japan is expected to continue beyond 2029

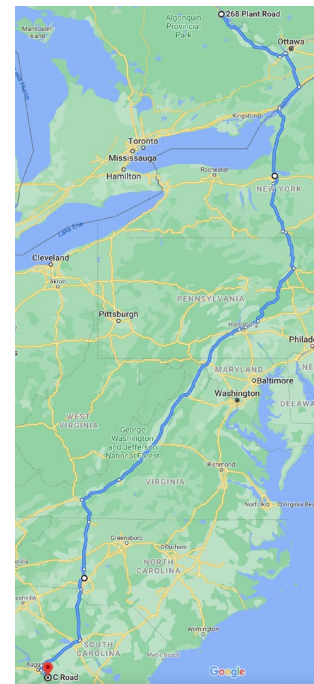


- Two NRC approved routes from the Canadian/U.S. border to South Carolina (traversing NY, PA, MD, WV, VA, NC, SC,GA,SC).
- 49 CFR § 397.101 - DOT requires that the transportation of a highway route controlled quantity of Class 7 (radioactive) material follow a preferred route. This is an Interstate System highway for which an alternative route has not been designated by a state routing agency.



Route 231 via Fort Erie/Buffalo

- Quebec
- Ontario
- New York
- Pennsylvania
- West Virginia
- Virginia
- North Carolina
- South Carolina
- Georgia
- South Carolina



Route 246 via Alexandria

- Quebec
- Ontario
- New York
- Pennsylvania
- Maryland
- West Virginia
- Virginia
- North Carolina
- South Carolina
- Georgia
- South Carolina

- Joint Base Charleston (JBC) is the only approved receiving port for maritime shipments conducted under the NNSA Nuclear Material Acceptance Programs
- JBC has received over 70 nuclear material removal maritime shipments since 1996
- Cooperation with JBC has resulted in the safe and secure receipt of over 1,865 kilograms of HEU and plutonium from over 30 countries around the world
- Based on number of casks per shipment the package is delivered to SRS by rail or truck.

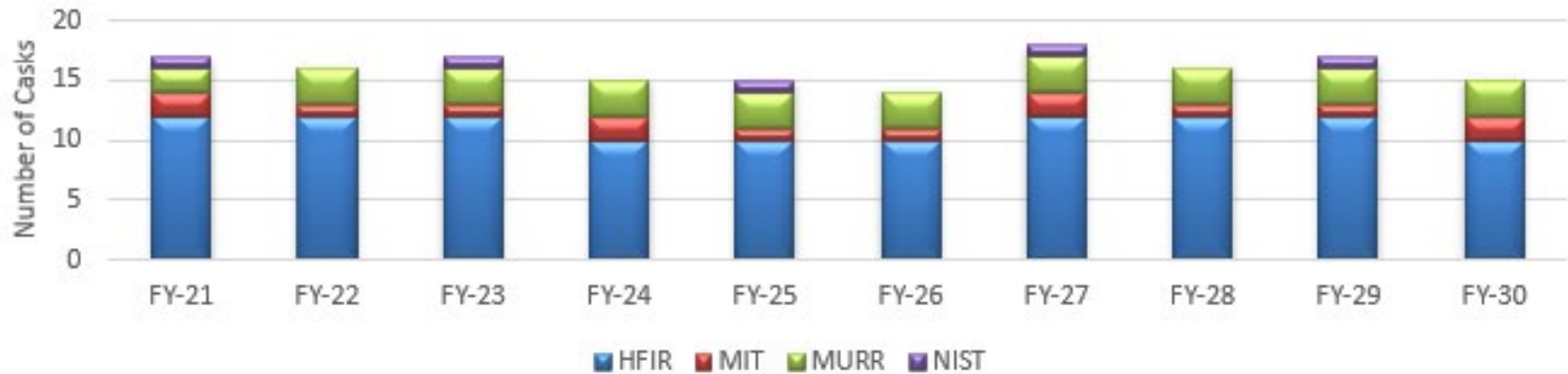


Domestic Fuel Receipts

- Support of Reactor Operations to produce therapeutic and diagnostic isotopes to the Nuclear Medicine community (MURR)
- Advance Science in dynamics of matter, applied research, industrial, and research isotope production. (HFIR)
- Support nuclear materials and in-core research programs to support advanced power reactors (MURR, MIT, NIST)
- Domestic receipts are planned till FY-32, all domestic reactors are working on LEU conversion and may continue to ship spent fuel to SRS.



DRR Receipt Sites



DRR Projected Receipts

Transport Package



GNS-16



TN-7/2



JRF-90Y-950K



LWT



JRC-80Y-20T



TN-MTR



GE-2000



JMS-87Y-18.5T

- ***Type-B Radiological Package***

- Cask conforms to U.S., IAEA & Canadian standards (In case of LWT).
- The NRC reviewed the cask design met all U.S. regulations for transporting each type of material and issued a Certificate of Compliance (CoC).
- A U.S. Certificate of Competent Authority (CoCA) was issued by the U.S. DOT to allow international use.
- The Canadian Competent Authority, the Canadian Nuclear Safety Commission (CNSC), performed its own review of the cask and its inserts and issued a Canadian CoCA.

Japan Removal (Example)



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SRNS

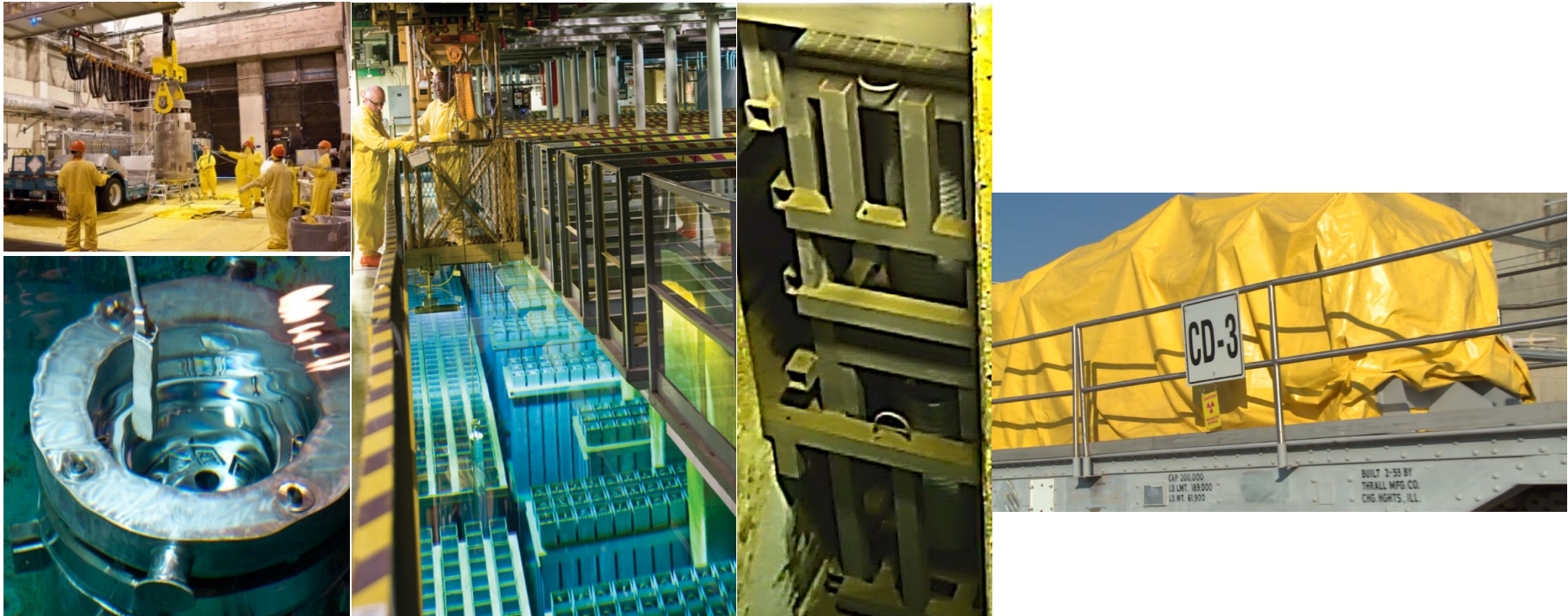
Savannah River Nuclear Solutions

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Current Mission

Mission – One of only two operating facilities in the nation, for the safe receipt, storage, handling, and shipment of Spent Nuclear Fuel (SNF) and other Special Nuclear Material (SNM).



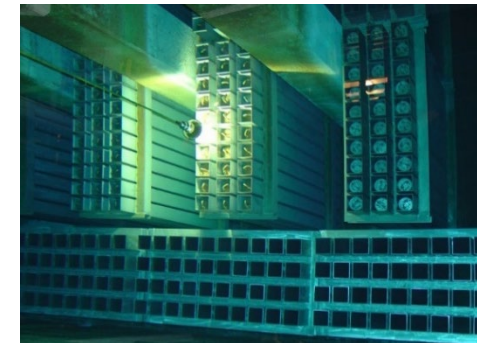
Offsite Fuel Receipt

Safe Storage

Transfer to H-Canyon for processing

➤ L Area Material Storage Facility:

- The disassembly Basin is a 3.4-million gallon basin with depths from 17 feet to 50 feet.
- Capable of handling wide variety of fuel sizes, shapes, enrichments and fuel conditions
- Limited Dry storage
- Rail or Trailer Access for Casks



L Basin Fuel Racks

➤ L Area Inventory (SNF)

Fuel Clad	Storage Containers (approx.)	Fuel Assemblies (approx.)	MTHM	H-Canyon Disposition Pathway	Additional Handling
Aluminum Clad	3000	13000	9.2	Chemical Dissolver	None
Non-Aluminum Clad	395	2000	20	Electrolytic Dissolver	Repackage

○ Storage Capacity

- MTR: 85% (full)
- HFIR 54% (full)

➤ Heavy Water

- Heavy water stored at SRS was used in the five production reactors built and operated onsite
- ≈ 6,800 Stainless Steel Drums
- ≈350,000 gallons (1.32 x 10⁶liters)
- ≈ 140,000 gallons (530,000 liters) in C & K Area storage tanks
- Average H-3 activity of all heavy water is 1,800 μCi/ml



Dry stored fuel



Heavy Water in drums