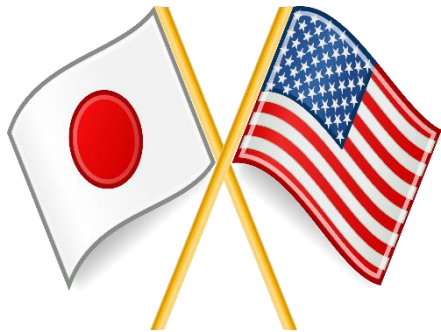




1st International Forum on the Decommissioning of Fukushima Dai-ichi Nuclear Power Station



COOPERATION & COLLABORATION

Dr. Monica C. Regalbuto

Assistant Secretary, Office of Environmental Management

United States Department of Energy

April 10, 2016



- 1) Overview of Office of Environmental Management**
 - **Nuclear cleanup mission**
 - ◆ **Highlight nuclear facility decommissioning experience**
- 2) Key institutional elements of the cleanup program**
- 3) Cooperation and Collaboration**
 - **Bilateral Commission on Civil Nuclear Cooperation**
 - ◆ **Key Activities of Decommissioning and Environmental Management Working Group**
 - **Robotics**
- 4) Closing**



United States (U.S.) Department of Energy (DOE) Office of Environmental Management (EM)

Program Overview

Nuclear Facility and Reactor Decommissioning Experience



OFFICE OF ENVIRONMENTAL MANAGEMENT

Safe cleanup of the environmental legacy created after six decades of nuclear weapons production and federal government-sponsored nuclear science research and technology development



The Hanford Reach
White Bluffs Overlooking the Columbia River

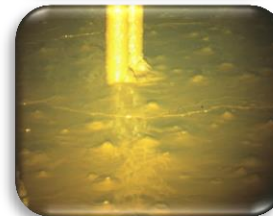
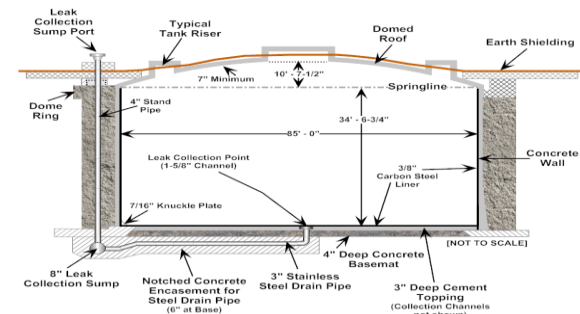
Nuclear Facility Decommissioning



Soil and Water Cleanup



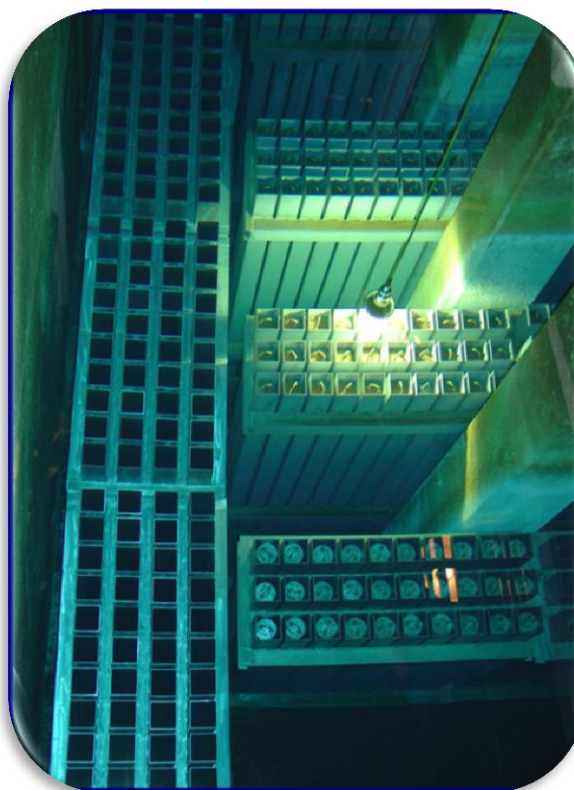
Liquid Radioactive Waste Processing & Disposition



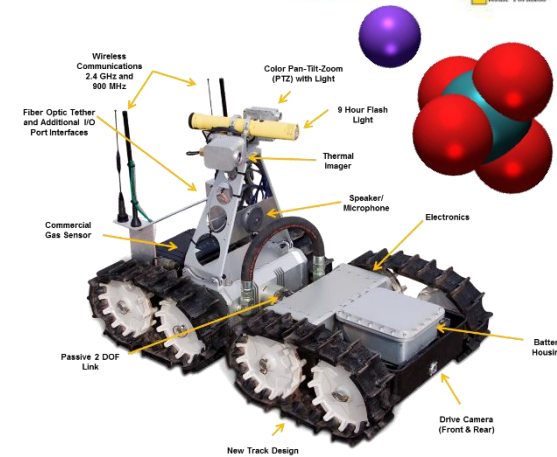
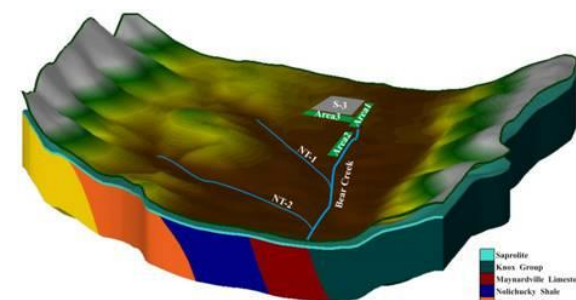
Solid Radioactive Waste Treatment, Storage & Disposal



Nuclear Materials & Spent Nuclear Fuel Management



Science & Technology



Original Scope of Legacy Cleanup



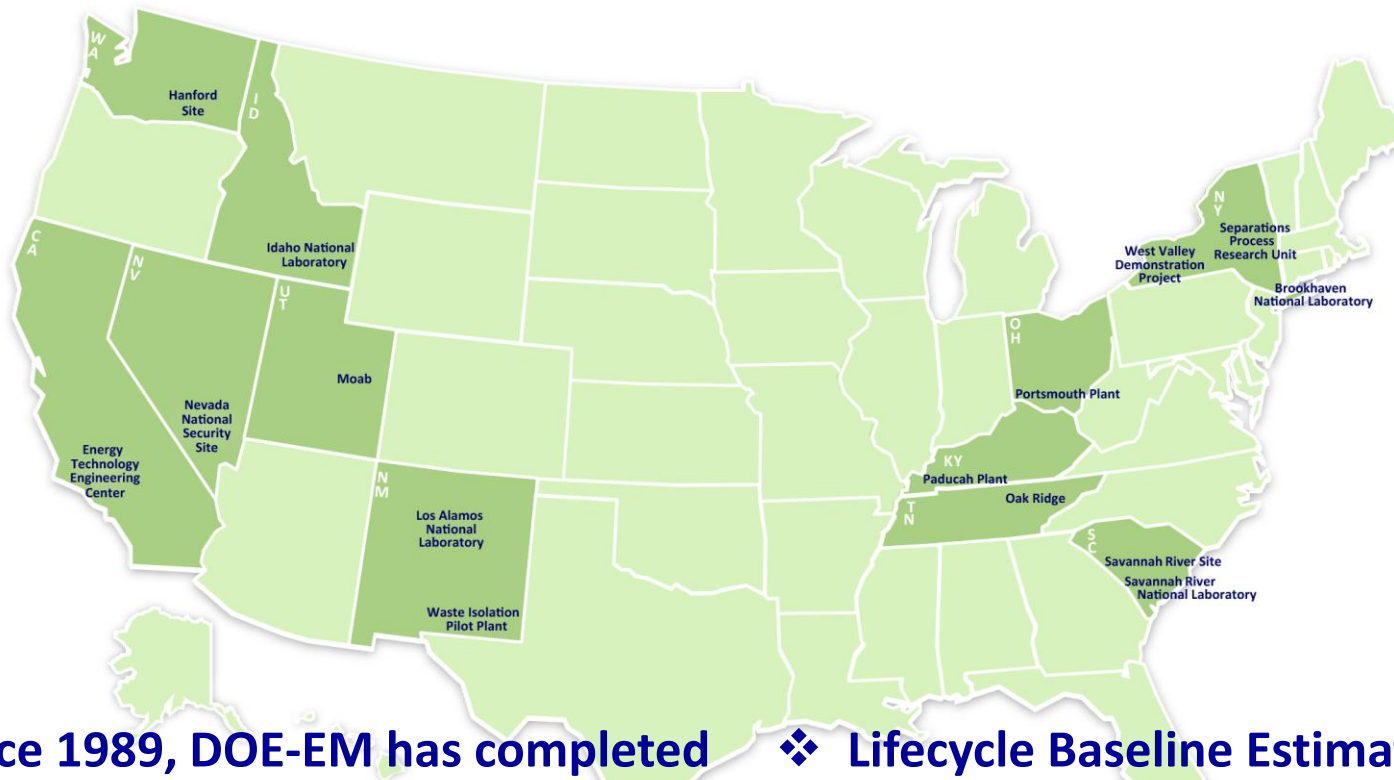
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Remaining Scope of Legacy Cleanup



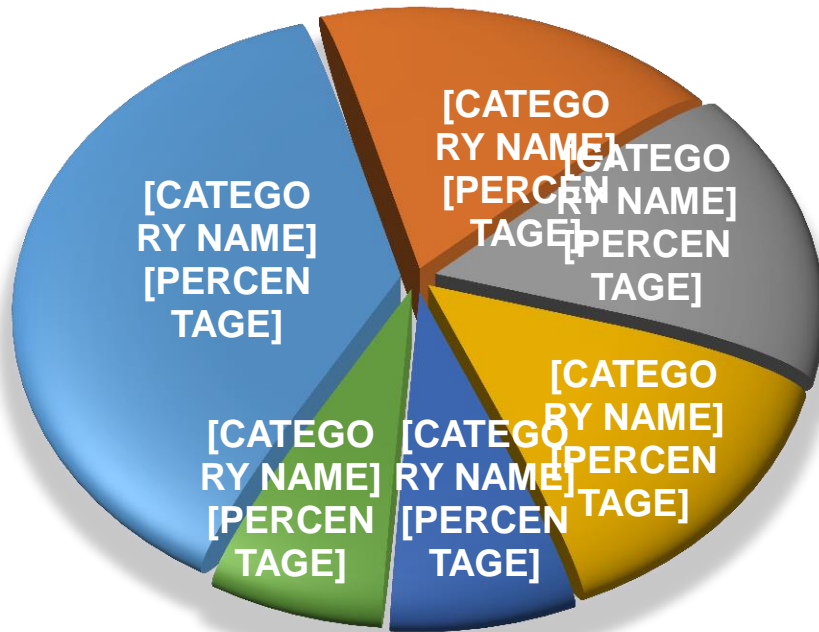
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MANAGEMENT



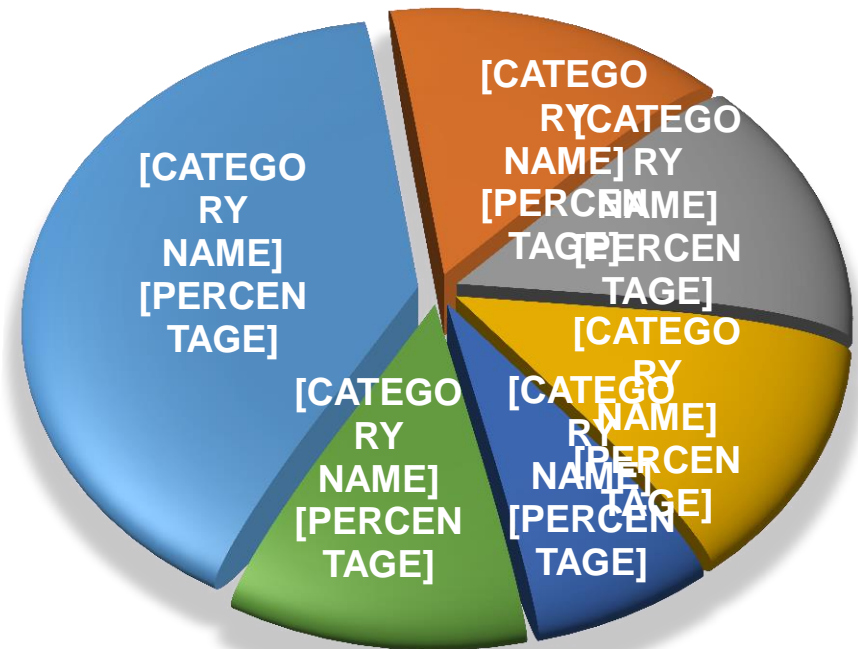
- ❖ Since 1989, DOE-EM has completed its cleanup mission at 91 of the 107 major nuclear weapons and nuclear research sites
 - US\$152B (¥17,452B) spent

- ❖ Lifecycle Baseline Estimates of Remaining Scope
 - US\$235B (¥26,981B)
 - 2065 completion

**Fiscal Year 2016 (Approved):
US\$6.218B (¥713.913B)**



**Fiscal Year 2017 (Requested):
US\$6.119B (¥702.574B)**



HANFORD SITE

6 of nine reactors are in interim, safe storage

1 reactor was converted for public visits

2 more reactors will be placed in safe storage in the next few years

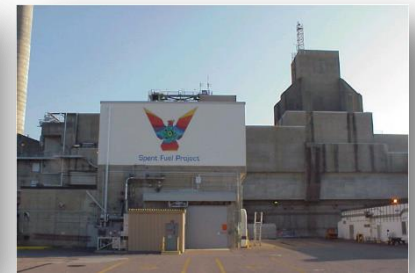


SAVANNAH RIVER SITE (SRS)

2 of five reactors are entombed

1 reactor is used as a decon facility

2 reactors temporarily store special nuclear materials and spent nuclear fuel



Research Reactor Decommissioning



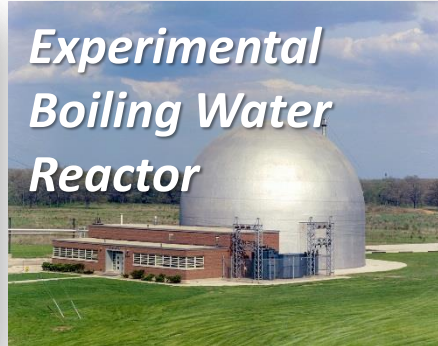
OFFICE OF ENVIRONMENTAL MANAGEMENT

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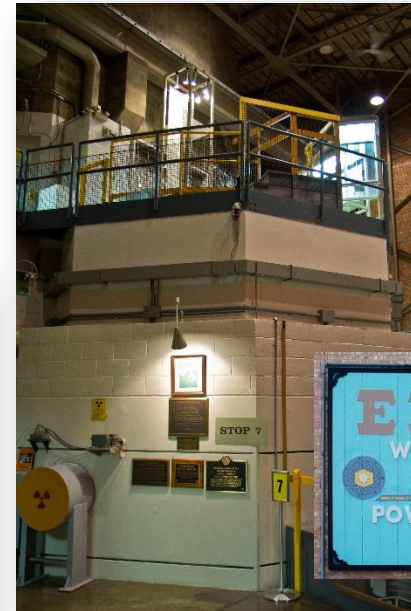
research reactors of various designs across the DOE complex are in various phases of decommissioning



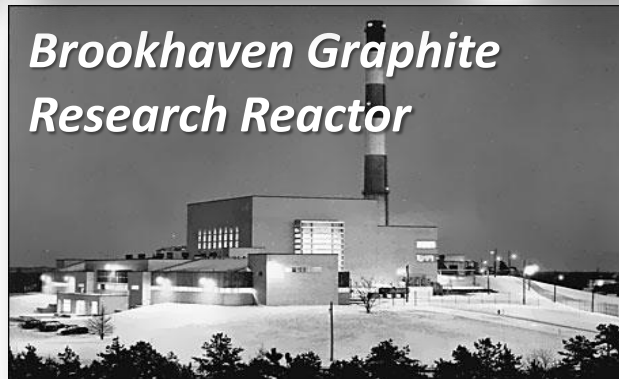
High Flux Beam Reactor



Experimental Boiling Water Reactor



Chicago Pile 5



Brookhaven Graphite Research Reactor



Heavy Water Components Test Reactor

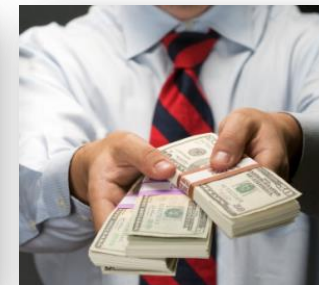
Worker Responsibility



Manager Responsibility



Senior Leader Responsibility



- ☑ **Protective of human health and the environment**
 - ☑ **Complies with laws, rules and regulations**
 - ☑ **Considers overall impacts to the environment**
 - ☑ **Advocates risk-informed decisions**



❖ Stakeholder Involvement and Public Participation

➤ Participate in the decision-making process





Japan – U.S. Cooperation and Collaboration

Bilateral Commission on Civil Nuclear Cooperation

**Decommissioning and Environmental Management Working
Group (DEM WG)**



Bilateral Commission on Civil Nuclear Cooperation

Civil Nuclear Energy R&D Working Group

Emergency Management Working Group

Decommissioning and Environmental Management Working Group

Nuclear Security Working Group

Safety and Regulatory Issues Group

Bilateral cooperation on consequences from Fukushima Dai-ichi NPS

- Facility Decommissioning
- Spent Fuel Storage and Decontamination
- Long-Term Consequence Management

- ❖ **Research and Development Collaboration on Advanced Decommissioning Science**
 - **DOE-EM and MEXT agreed to sponsor university-led research on topics of mutual interest**
 - ◆ **Radioactive waste treatment and packaging**
 - ◆ **Rapid analysis of radiological contaminants**
 - ◆ **Risk modeling tools and techniques**



- ❖ **JAEA's Collaborative Laboratories for Advanced Decommissioning Science (CLADS) Program**
 - International laboratory for research and development on decommissioning science
 - Focus on cleanup in and around the Fukushima Dai-ichi Nuclear Power Station

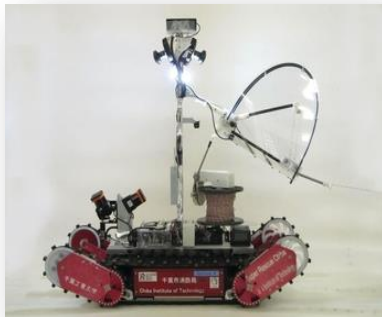


- ❖ **Propose creating a National Laboratory Fukushima Support Network**
 - **Expand involvement of U.S. national laboratories**
 - **Provide forum for regular exchanges of information**
 - **Provide access to the technical expertise and capabilities**
 - **Sponsored by DEMWG**

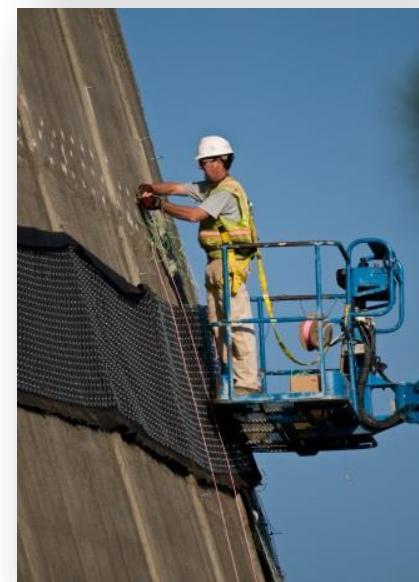


❖ Robotics Technologies

- Invaluable experience already gained from recent deployments at Fukushima Dai-ichi Nuclear Power Station



- ❖ We share a common interest in robotics for
 - ALARA and enhancing the safety of our workers
 - Handling highly radioactive materials and waste
 - Accessing hard-to-reach and out-of-reach spaces
 - Performing worker tasks that are
 - ◆ Dirty
 - ◆ Dull
 - ◆ Dangerous
 - ◆ Difficult
 - Responding to unplanned events and emergencies





Closing Remarks

“Coming together is a beginning, staying together is progress, and working together is success.” Henry Ford, US Inventor



Japan and the U.S. continue to work closely together to assure the safe and protective decommissioning of the Fukushima Dai-ichi Nuclear Power Station