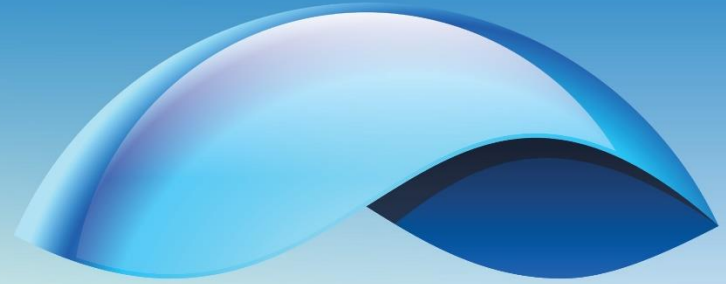
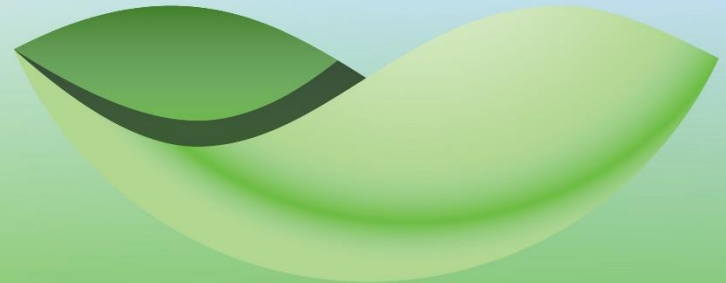


International Conference on
**The Safety of Radioactive
Waste Management,
Decommissioning,
Environmental Protection
and Remediation**

**6-10 November 2023
Vienna, Austria**



**Ensuring Safety and
Enabling Sustainability**



**An Overview of the U. S. Nuclear
Regulatory Commission
Decommissioning Program: PROGRESS
TOWARDS FULFILLING THE
SUSTAINABILITY PROMISE!**

Bruce A. Watson, CHP

United States Nuclear Regulatory Commission

Office of Material Safety and Safeguards

Division of Decommissioning, Uranium Recovery and Waste
Programs

Washington, D.C., U.S.A

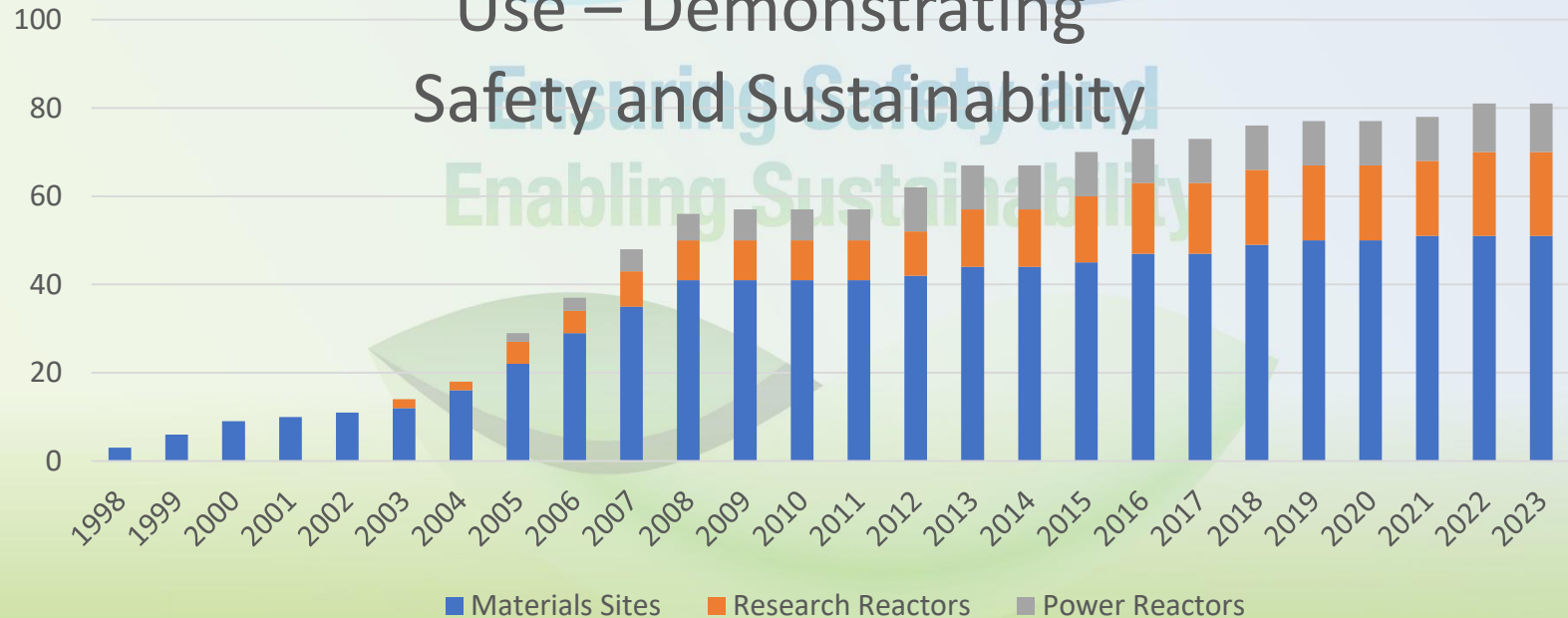
Bruce.watson@nrc.gov

Decommissioning Topics

- Overview of the US NRC Decommissioning Program
- Summary of our Regulatory Framework
- Experience with 1997 Regulations “License Termination Rule” and overview of current U.S. Decommissioning Process
- Ensuring Safety and Enabling Sustainability in the Regulatory Framework and Inspection Program
- Examples of Fulfilling the Promise of Sustainability

Complex Decommissioning Site License Terminations Since 1998

81 Licenses Terminated for Unrestricted Use – Demonstrating Safety and Sustainability



US NRC Decommissioning Program

Present Decommissioning Site Status

- 17 Power Plants in active decommissioning
- 8 Power Plants in SAFSTOR
- 2 Research reactors
- 8 Complex materials sites
- 5 Uranium Mill (UMTRCA) Sites in Decommissioning
- 25 Uranium Mill Sites in DOE Long Term Stewardship

1997 Decommissioning Regulations, Setting Safe Decommissioning Standards

- Decommissioning funding financial assurance requirements for all licensees
- License termination criteria for unrestricted use is 25 mrem/y (0.25 mSv/y) and demonstration of ALARA/Dose Optimization Principle
- Complex Material Sites with long lived radionuclides are to begin decommissioning within 2 years
- Reactor Regulations were based on Lessons Learned from first 3 Power Reactor Decommissionings and allow 60 years to complete decommissioning. The operator decides on the decommissioning strategy, immediate, deferred or a combination of the two

Decommissioning Planning Rule, Ensuring Safety and Sustainability

- In 2011, NRC issued the “Decommissioning Planning Rule,” to help prevent legacy sites.
 - The rule requires the ground water monitoring near the potential sources of leaks from the facility to alert the operator of leaks to allow repairs that over the long-term may impact the environment and the cost of decommissioning
- In 2012, Reg Guide 4.21, “Decommissioning Planning During Operations,” was issued to provide implementation guidance
- Inspection results since 2012 have proven the new regulation is effective

Ensuring Safety - Licensing

- Licenses and license amendments
 - Decommissioning Plans
 - License Termination Plans
 - Final Status Survey Reports
- Security Plans
- Technical Specifications
- Environmental Requirements
- Safety Culture

License Transfers, Financial and Technical Qualifications Reviews Ensures Safety

Beginning in 2014:

- Vermont Yankee
- Oyster Creek
- Pilgrim
- Indian Point 1, 2, 3
- Crystal River
- Three Mile Island 2
- Kewaunee
- Palisades



Ensuring Safety - Inspection Programs

Inspection Manual Chapters:

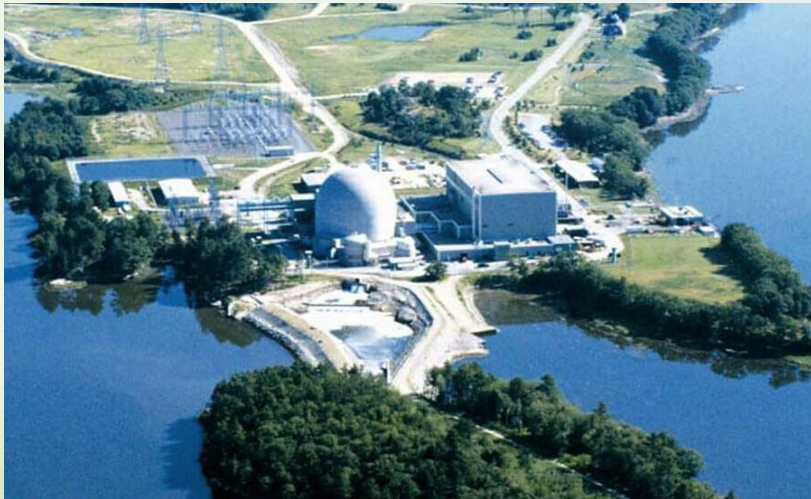
- 2561, Decommissioning Power Reactor Inspection Program
- 2602, Decommissioning Fuel Cycle, Uranium Recovery and Materials Inspection Program
- 2800, Materials Inspection Program
- 2801, Uranium Recovery and 11e(2) Byproduct Material Facility Inspection Program

Ensuring Safety – Independent Verification Confirmatory Surveys and Sampling



Maine Yankee – Nature Park

**Operating Plant Before
Decommissioning**



**A new Community Park and Nature
Trail after license termination**



Big Rock Point – Historical Significance to Native Americans

License Terminated in 2007

The Big Rock Nature Area



Safe
usta

Rancho Seco – Combined Cycle fossil plants and new Zinfandel plants

License Terminated in 2009



New Zinfandel Vines



Ensuring S
Enabling Su

Humboldt Bay – Reuse for Grid Stability and former intake canal will be a Municipal Marina



West Valley Demonstration Project

Main Process Plant Demolition



Solar Panels



Beneficial Uses at Uranium Mill Tailings Sites

Mill and Mill Tailings Sites



Tuba City



Future Small Modular Reactor Sites?



Safe
Enabling Sustainability

Three Mile Island Unit 2



Safety
Sustainability



Final Thoughts

- NRC's Regulatory Framework is flexible, performance-based and risk-informed
- Licensing and Inspection Programs ensure safety
- Safety leads to sustainability, allowing nuclear sites to be released from regulatory control for unrestricted use
- In the U.S., all licenses have been terminated for unrestricted use and are available for economic re-development by the property owner
- Some sites will likely house the new generation of reactors, such as Small Modular Reactors