

# 20 Years of the License Termination Rule: Status and Update of Decommissioning Power Reactors and Material Facilities and Issues

Christopher McKenney  
Division of Decommissioning, Uranium Recovery  
and Waste Programs  
Waste Management 2017  
Session 89, March 8, 2017

- NRC's mission is to ensure plant safety, whether the plant is operating, or transitioning from operating to decommissioning, and through the entire process until the plant has been radiologically decommissioned and the license is terminated.

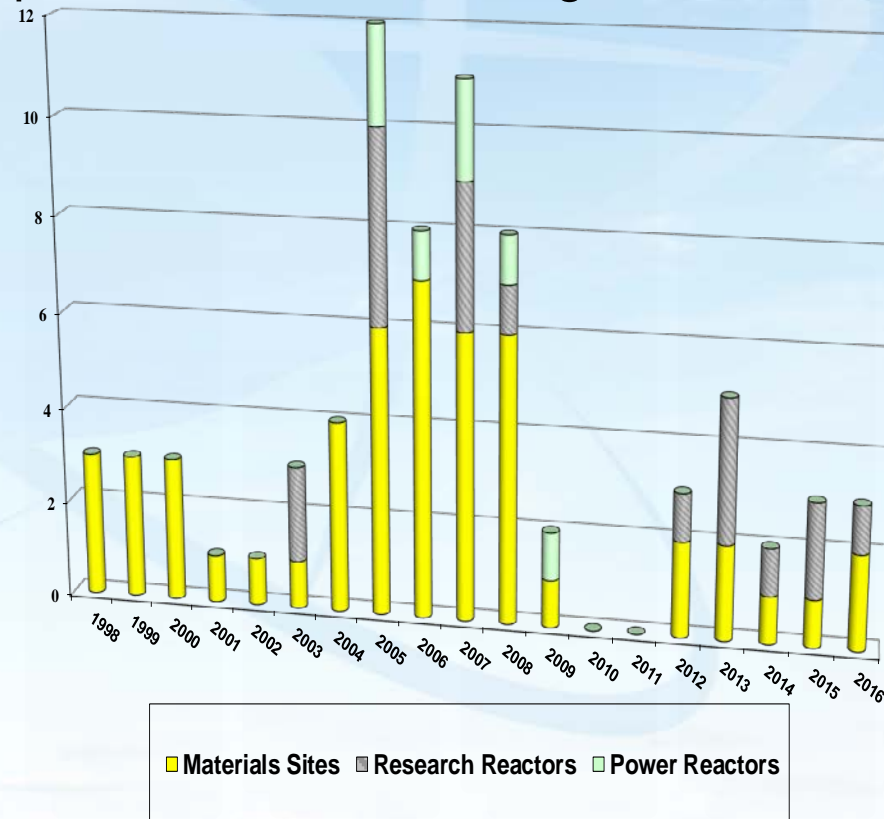
## Present Status

- 6 Power Plants in active decommissioning
- 14 Power Plants in SAFSTOR
- More shutdowns are anticipated
- 13 Complex Material Sites are in decommissioning

# Decommissioning Background

- Current 1997 decommissioning regulations are performance-based and risk-informed
- Extensive decommissioning experience
- A total of 10 power reactor sites have completed decommissioning:

Fort St. Vrain, CO - DOE Ownership of the Fuel  
 Haddam Neck, CT – GL ISFSI  
 Maine Yankee, ME – GL ISFSI  
 Yankee-Rowe, MA – GL ISFSI  
 Big Rock Point, MI – GL ISFSI  
 Trojan, OR – SL ISFSI  
 Rancho Seco, CA- SL ISFSI  
 Saxton, PA - No fuel onsite  
 Shoreham, NY - No fuel onsite  
 Pathfinder, SD - No fuel onsite



# Rancho Seco – Sacramento, California



# Big Rock Point – Charlevoix, Michigan



# Yankee-Rowe – Rowe, Massachusetts



## Recent Unplanned Reactor Shutdowns

- **Kewaunee Power Station** – Carlton, WI (2013)
- **Crystal River Unit 3** – Crystal River, FL (2013)
- **San Onofre Units 2 & 3** – San Clemente, CA (2013)
- **Vermont Yankee Nuclear Power Station** – Vernon, VT (2014)
- **Fort Calhoun** – Omaha, NE (October 24, 2016)

## Future Reactor Shutdowns

- **Palisades** – Covert, MI (planned shutdown Oct. 1, 2018)
- **Pilgrim** – Plymouth, MA (planned shutdown 2019)
- **Oyster Creek** – Forked River, NJ (planned shutdown 2019)
- **Indian Point 2 & 3** – Entergy announced Jan. 9, 2017 that plant operations will cease in 2020/2021
- **Diablo Canyon 1 & 2** – Pacific Gas Electric announced plant operations will cease in 2025

## Recent Reprieves

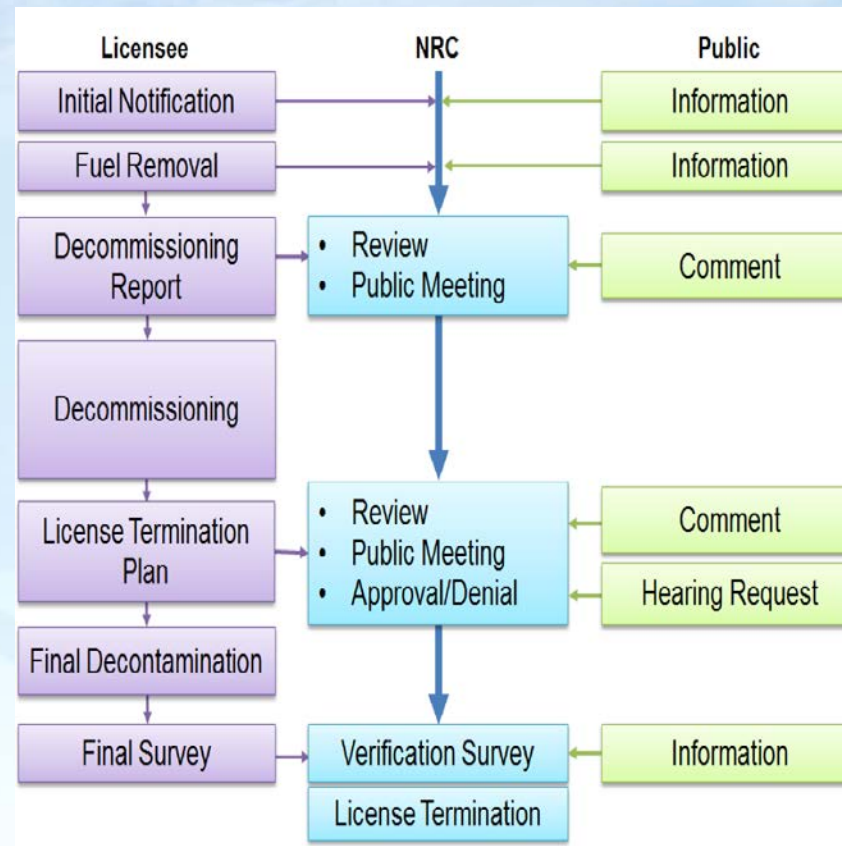
- **Clinton and Quad Cities 1 & 2** – State of Illinois rate relief (December 2016)
- **FitzPatrick** – New York's Clean Energy Standard (December 2016) and Exelon to buy plant from Entergy (2<sup>nd</sup> quarter 2017)

# Decommissioning Program Regulatory Framework

## Decommissioning Program

- Statutory authority
  - Integrated Decommissioning Program
- Comprehensive regulations:
  - Public involvement
  - Environmental review
  - Financial assurance
  - Site characterization
  - Site remediation/Radiological clean-up
  - Final site surveys
- Regulatory guidance
- Oversight and inspection

## Decommissioning Process





# Transitioning from Operation to Decommissioning

- License Amendments
  - Permanently defueled technical specifications
  - Revised emergency plan and Emergency Action Level scheme
- Exemptions from Title 10 Code of Federal Regulations
  - Emergency preparedness (Part 50, Appendix E)
  - Security plan and procedures (CFR Part 73)
  - Decommissioning trust fund (CFR 50.82)
  - Insurance and financial protection (CFR 50.54 and Part 140)
- Requests to rescind or relax orders
- Certified fuel handler training program
- NRC issued lessons learned report with emphasis on decommissioning licensing and oversight activities in October 2016 (ML16085A029)
- Rulemaking in progress to make transitioning more efficient

# Decommissioning Rulemaking

- Commission directed staff to consider the following issues and to complete rulemaking by 2019:
  - Revise regulations to account for decreased risk of shutdown plants
  - Graded approach to emergency preparedness
  - Lessons learned from previous and current decommissioning
  - NRC approval of Post-Shutdown Decommissioning Activity Report
  - Maintaining three existing decommissioning options and timeframes
  - Role of State/local governments and non-governmental stakeholders
  - Other issues deemed relevant by staff
- Advance Notice of Proposed Rulemaking (ANPR):
  - Request for comment published November 19, 2015
  - ANPR public comment period closed on March 18, 2016
  - Final Rule/Final Regulatory Guidance by 2019

# West Valley Demonstration Project - West Valley, New York



# Summary

- We continue to have uncertainty in the energy market with several reactors entering decommissioning in the next several years
- The staff completed a lessons learned report in October 2016 on the license actions for a transitioning reactor
  - Experience and efficiencies have been gained with the processes in place
  - Lessons learned to be applied through the current rulemaking
- Material sites continue to make progress on decommissioning