

# The NRC Reactor Decommissioning Process – Post Shutdown Decommissioning Activities Report (PSDAR) License Termination Plan (LTP)

## Nuclear Decommissioning Citizens Advisory Panel for Vermont Yankee


January 28, 2015

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# Agenda

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- Opening Remarks – Andrew Persinko, Deputy Division Director - DUWP
  - Meeting Announcements
  - Reactor Decommissioning Process
    - Regulatory Basis
    - Decommissioning Experience
    - Post Shutdown Decommissioning Activities Report
    - License Termination Plan
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# Mission

- The NRC licenses and regulates the Nation's civilian use of radioactive materials to protect public health and safety, promote the common defense and security, and protect the environment.



# Meeting Announcements

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- February 5<sup>th</sup> 3 - 4:30 PM – Webinar on the Reactor Decommissioning Process and Vermont Yankee. To register, <https://attendee.gotowebinar.com/register/5535875383432936961>
  - February 19<sup>th</sup> 6 – 9 PM – Public Meeting on the Vermont Yankee Post Shutdown Decommissioning Activities Report. Brattleboro Quality Inn

# Power Reactor Decommissioning Regulations

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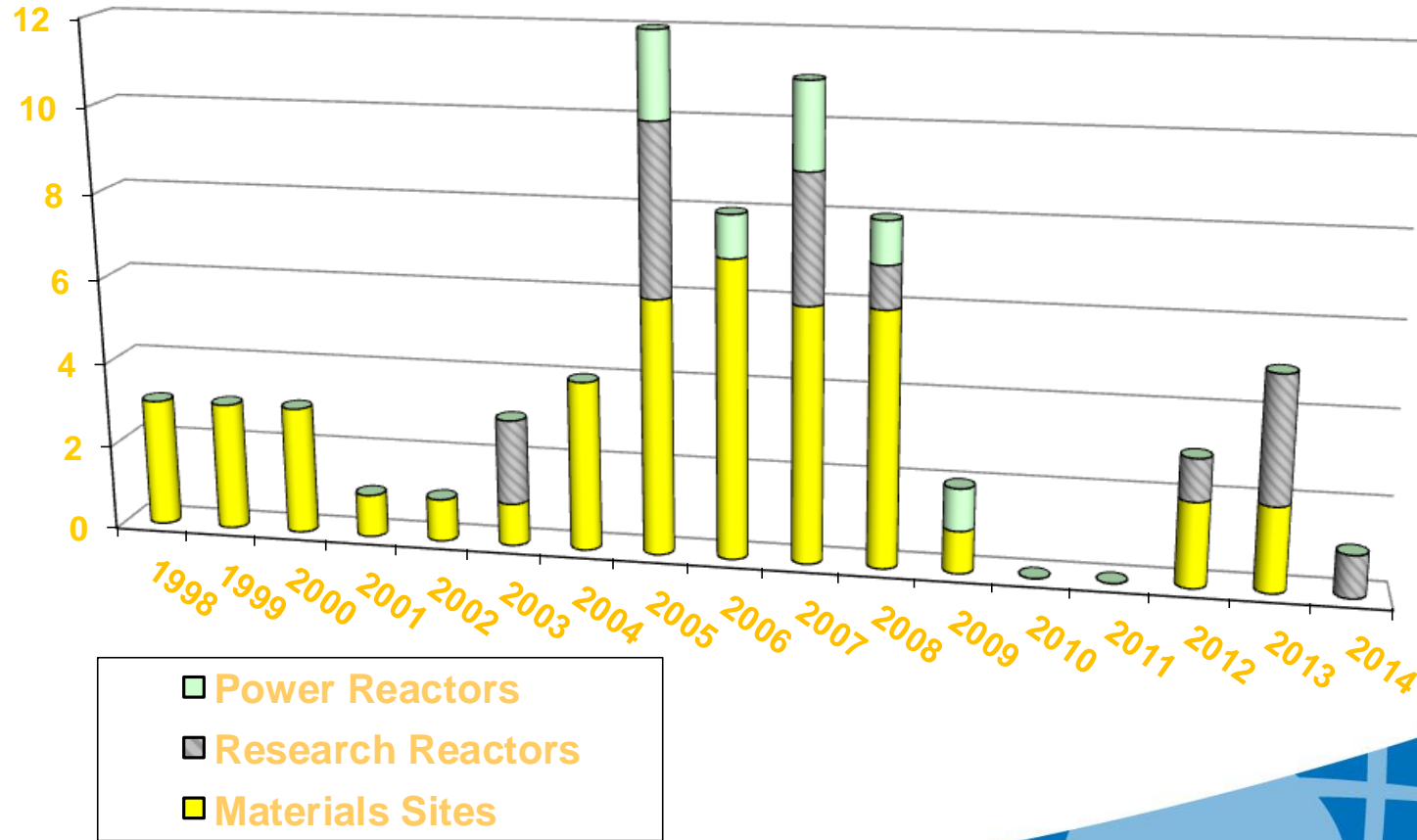
## Atomic Energy Act of 1954, as Amended

- 10 CFR Part 20 Subpart E “License Termination Rule” was implemented in 1997
- 10 CFR Part 50 – Operating License
- 10 CFR 50.75 Planning for Decommissioning
- 10 CFR 50.82 - Termination of License

# 10 CFR 50.82 License Termination

- Certifies Permanently Shutdown
- Certifies Permanent Reactor Defueling
- Post Shutdown Decommissioning Activities Report required within 2 years of permanent cessation of operations to NRC and affected States
- License Termination Plan

# NRC Decommissioning Experience



# **NRC Decommissioning Experience Since 1997**

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- 7 Power Reactor Licenses Terminated
- 45 plus Complex Material Sites Licenses Terminated
- 14 Research Reactor Licenses Terminated





# Decommissioning

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As defined in 10 CFR 50.2 “Decommission” means **to remove a facility or site safely from service and reduce residual radioactivity** to levels that permits either:

- Release of the property for unrestricted use and termination of the license;

or

- Release of the property for restricted conditions and termination of the license.

# 10 CFR 20 Release Criteria

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- Unrestricted Release
  - Total Effective Dose Equivalent (TEDE)  $\leq 25$  mrem (0.25 mSv/a) and As Low As is Reasonably Achievable (ALARA)
  - Average member of the critical group
  - All pathways
  - Period of performance - 1000 years
- Restricted release
  - $\leq 25$  mrem (0.25 mSv/a) TEDE and ALARA, with institutional controls in effect
  - Legally enforceable institutional controls
  - If institutional controls fail, doses do not exceed 1 mSv/a, or 5 mSv/a, under specific circumstances
  - Financial assurance - independent third party
  - Licensee and NRC public input/outreach requirements

# Reactor Decommissioning

## Performance Based Risk-Informed Regulations

- Reactor Decommissioning is required to be completed in 60 years.
- Bases: 50 y in SAFSTOR + 10 y DECON
- Radiation Dose Rates reduced to 1-2 %
- Radioactive Waste Volumes reduced to 10%
- Allows Decommissioning Fund to increase
- Regulatory Guide 1.184 “Decommissioning of Nuclear Power Reactors”



# Post Shutdown Decommissioning

## Activities Report - Why 2 Years?

- Purpose of the PSDAR
- Decommissioning Planning Strategy – DECON Prompt Dismantlement, SAFSTOR Deferred Dismantlement or Entomb?
- Many factors to consider in the decision-making process



# Post Shutdown Decommissioning Activities Report

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## PSDAR Content:

- A description and schedule for the planned decommissioning activities
- An estimate of the expected decommissioning costs
- A discussion that provides the means for concluding that the environmental impacts associated with the decommissioning activities will be bounded by appropriately issued Environmental Impact Statements.

# Post Shutdown Decommissioning Activities Report

## NRC Actions:

- Notices receipt of the PSDAR in the *Federal Register*
- Makes the PSDAR publically available at <http://www.nrc.gov> and Public Document Room
- NRC holds a Public Meeting in the vicinity of the licensee's facility to discuss the PSDAR and solicit public comments

# Post Shutdown Decommissioning Activities Report

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## NRC Public Meeting Actions:

- Host a public meeting to obtain public comments on the PSDAR
- Publish Meeting Notice in the Federal Register and local newspapers/media
- During the informational meeting, invite Licensee, State and Local Officials, and general public to comment on the PSDAR
- A written transcript will be made publically available

# NRC's PSDAR Review Process

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- Content Requirements are in 10 CFR 50.82(a)(4)(i)
- Staff uses Regulatory Guide 1.185 to ensure the document meets requirements
- Project Manager coordinates the PSDAR technical reviews
- Requests for Additional Information may be developed





# NRC's PSDAR Review Process

## Decommissioning Activities

- Planned Decommissioning Activities and Schedule
  - Activities Unique to the Facility
  - NRC Safety Review
  - Determine NRC Oversight/Inspection
  - Determine NRC Licensing Activities



# NRC's PSDAR Review Process- Decommissioning Cost Estimate

- Site Specific Decommissioning Cost Estimate
  - Ensure **reasonable assurance that** funds are there to perform the radiological cleanup
  - If decommissioning is delayed, ensure the licensee has a means of adjusting the cost estimate and funding over the storage period
  - Annually Update!



# NRC's PSDAR Review Process – NEPA

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- Reasons for concluding that Environmental Impacts associated with the decommissioning activities are bounded by the previously issued EISs.
  - NUREG 0586, “Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities”
  - Inspection Program



# NRC's PSDAR Review Process

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- After no additional information is required, NRC will notify the Licensee.
- NRC does not approve the PSDAR
- Licensee may begin major decommissioning activities 90 days after NRC receives the PSDAR



# License Termination Plans (LTP)

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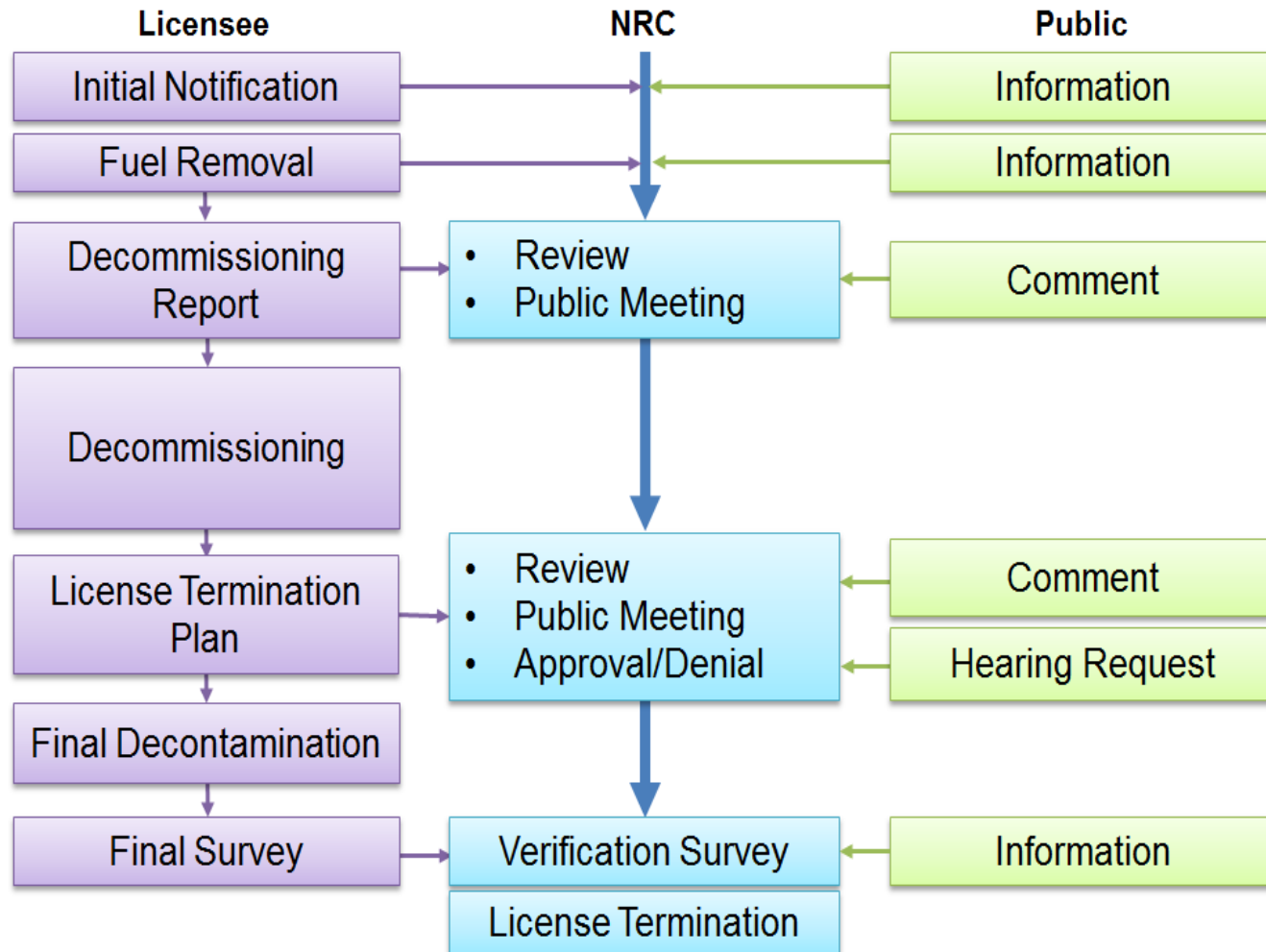
- Licensee conducts decommissioning in accordance with the license and technical specifications
- NRC continues on-site inspections
- Licensee submits the LTP at least 2 years prior to requesting license termination
- NRC notices the LTP in the Federal Register
- NRC holds a Public Meeting to discuss the LTP

# License Termination Plan

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- NRC will perform an acceptance and technical review
- Request additional information, if necessary
- Public Meeting and Opportunity for Hearing
- NRC approves the LTP by license amendment
  - Safety Evaluation Report
  - Environmental Assessment
- License is terminated upon demonstration by the licensee and NRC confirmatory survey that the site meets the unrestricted release criteria.

# Reactor Decommissioning Process



# NRC's Regulatory Oversight Continues

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## Decommissioning Inspection Program

- Inspection Manual Chapter 2561
- ~ 40 Inspection Procedures
- 12 Core Inspection Procedures
- 28 Discretionary Inspection Procedures
- Inspection Program is adjusted to site activities





# Reactor Decommissioning Program

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- 19 Power Reactors in Decommissioning
  - ✓ 5 Active DECON
  - ✓ 14 in SAFSTOR
  - ✓ 1 in Transition to SAFSTOR
- 7 Research Reactors in Decommissioning
  - ✓ 3 Active DECON
  - ✓ 4 in SAFSTOR
  - ✓ 1 expected to cease operations in 2015

# Thank You!!!

## Questions?



- **OPTIONAL SLIDES**



# Rancho Seco

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# Fermi 1





# LaCrosse BWR



# Humboldt Bay Site

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# Maine Yankee





# Reactors in Decommissioning Status

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- 5 Reactor Sites have new or additional generation plants
- 6 Reactor Sites are at multi-unit nuclear sites
- 8 Reactor Sites are “Greenfield” but 6 have ISFSIs
- 3 New Reactor Sites – TBD, San Onofre has a 3<sup>rd</sup> party agreement with US Navy

# Reactor Decommissioning Decision-Making Factors

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- Multi-Unit Site Safety
- Financial – Decommissioning Funds Availability
- Access to Radioactive Waste Disposal Capacity
- Future use of the Site
- Stakeholders
  - State Public Utility Commissions
  - Local Communities
  - Members of the Public/Rate Payers
- New Business Model
- Special Circumstances



