

An Overview of Power Reactor Decommissioning in the United States

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Overview

- Decommissioning Regulatory Framework
- Power Reactor Decommissioning Process
- Transition and Rulemaking
- Power Reactor Decommissioning Program Status
- Observations from NRC Decommissioning Experience
- Summary

NRC Decommissioning Program Regulatory Framework

- Statutory authority
- Comprehensive regulations:
 - Environmental review
 - Financial assurance
 - Site characterization
 - Site remediation/Radiological clean-up
 - Final site surveys
- Guidance
- Public Involvement
- Oversight

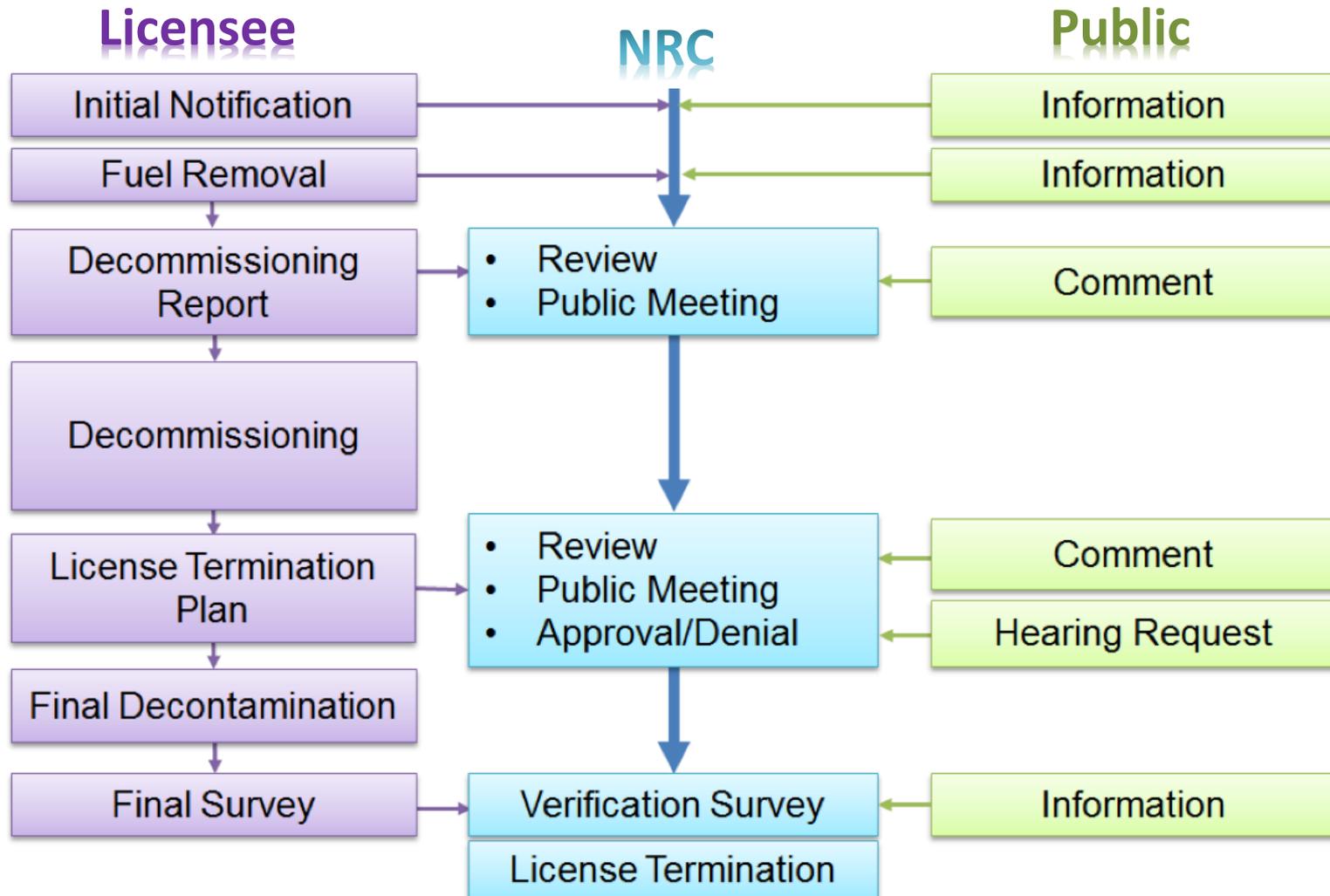
Reactor Decommissioning Alternatives

- DECON - prompt removal of radioactivity from equipment, structures, and site
- SAFSTOR - stabilize radioactively contaminated structures followed by dismantlement and decontamination in future
- ENTOMB - encase radioactive structures, systems, and components in a structurally long-lived substance (e.g., concrete)
- Decommissioning must be completed within 60 years of the plant ceasing operations.

Decommissioning Financial Assurance

- Costs for decommissioning range from \$280-\$612 million
- Cost factors include:
 - Timing and sequence
 - Type of reactor
 - Location of reactor
 - Waste disposal costs
 - Spent fuel storage costs
- Licensees report funding status at least once every 2 years then annually within 5 years of the planned shutdown and once the plant ceases operation
- Licensees must demonstrate financial assurance.

Power Reactor Decommissioning Process



Transitioning to Decommissioning

- **License amendments**
 - Permanently defueled technical specifications
 - Revised emergency plan and emergency action levels
- **Exemptions from Regulations**
 - Emergency preparedness
 - Security plan and procedures
 - Insurance and financial protection
- **NRC internal transfer of oversight**
- **Commission directed staff to pursue rulemaking to make transitioning from operation to decommissioning more efficient.**

Reactor Decommissioning Program Status

- 10 power reactors have terminated their licenses and have been released for unrestricted use
- 19 power reactors in decommissioning
 - 5 power reactors in active DECON or active dismantling
 - 14 power reactors in SAFSTOR or deferred dismantlement
- 7 power reactors have announced they will permanently cease operations by 2019

Maine Yankee Decommissioning



Observations from NRC Decommissioning Experience

- Early and frequent consultations between NRC, licensee, and governmental bodies and the public are important
- Detailed licensee project planning contributes to effective and safe decommissioning
- Lessons learned from actual decommissioning cases continue to inform NRC processes
 - Implement Guidance Updates
 - Maintain Communications
 - Encourage Community Involvement
 - Decommissioning Rulemaking

Summary & Conclusion

- NRC's decommissioning program has met our safety and security objectives
- NRC's power reactor decommissioning program is expanding as more shutdowns are anticipated
- Several regulatory issues related to transitioning from operations to decommissioning are being addressed through rulemaking