

# **Part 53 Rulemaking Overview State Liaison Officer Conference**

March 24, 2022



# Background Discussion of Part 53 Rulemaking

The NRC is strategically transforming and modernizing to prepare for safe deployment of

## ADVANCED REACTORS

Stakeholder  
Engagement

Transforming  
Our Workforce

Strategic  
Policymaking

Modernizing  
Our Tools

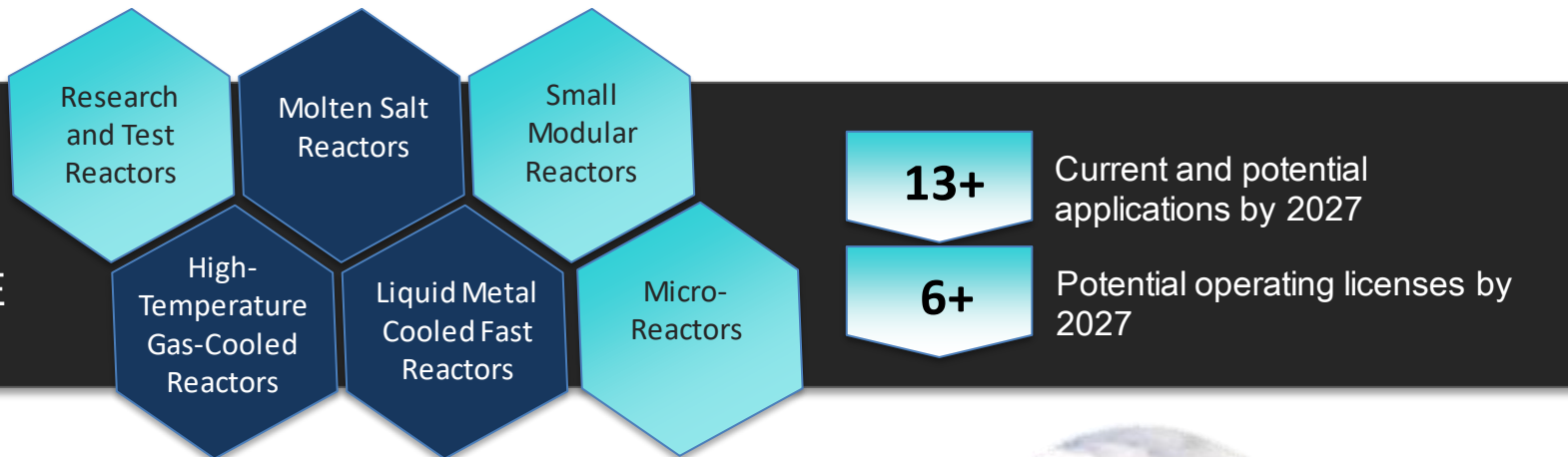
Supporting  
Innovation

Flexible  
Review Strategies



# NRC is preparing for a Variety of Advanced Nuclear Technologies

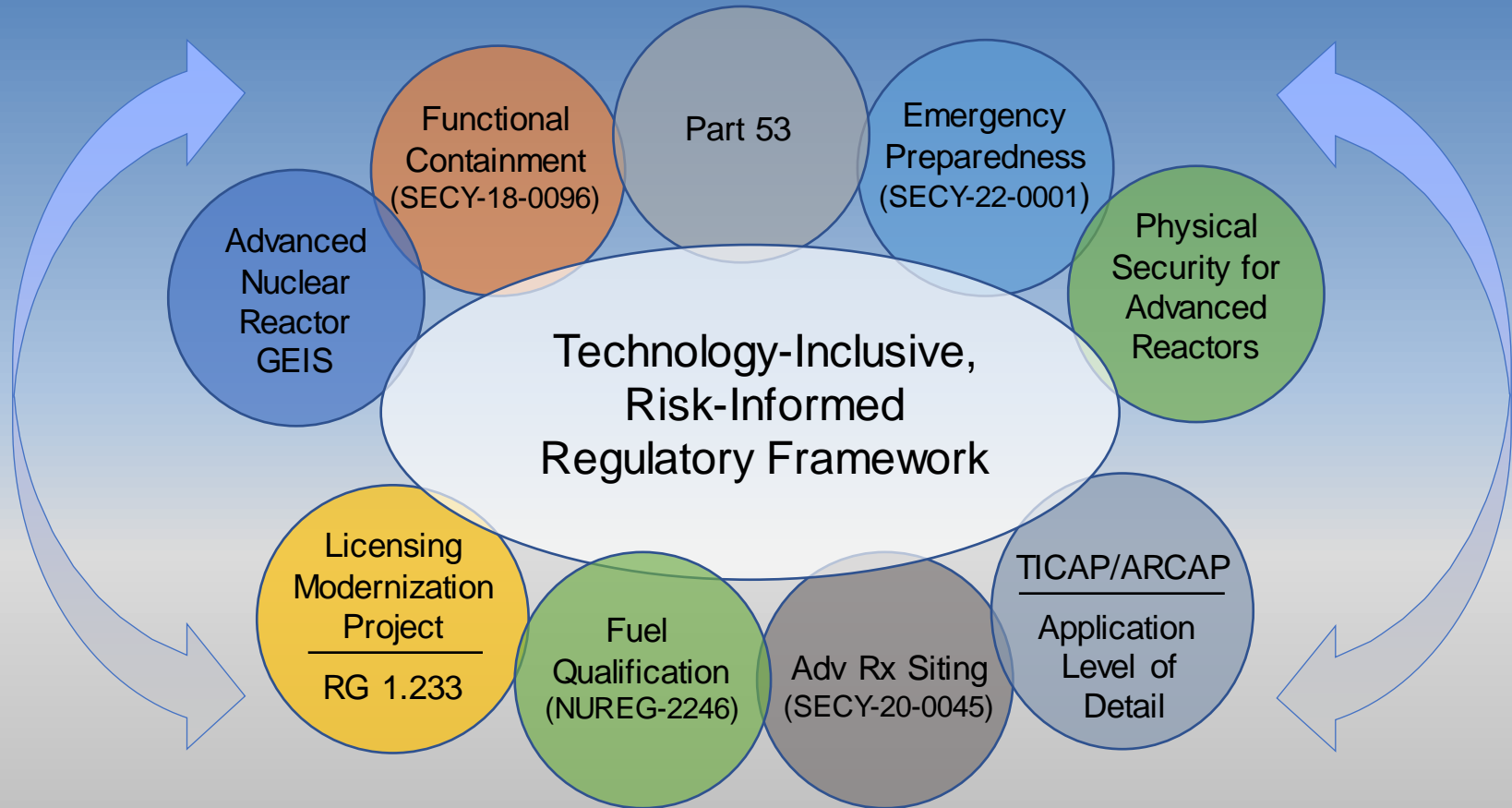
## EVOLVING LANDSCAPE



- Many different reactor technologies
- Range of sizes from < 10 MWt to 600 MWt
- Multiple reactors on a single site
- Hazards vary with power level and radionuclide inventory



# Modernizing the Regulatory Framework



See [SECY-22-0008](#), “Advanced Reactor Program Status”

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## Other Ongoing Advanced Reactor Activities to be Included in Part 53: Emergency Preparedness

- On 1/3/2022, the staff submitted to the Commission the draft final Emergency Preparedness for Small Modular Reactors and Other New Technologies rule (SECY-22-0001) (<https://www.nrc.gov/docs/ML2120/ML21200A055.html>)
- This rule requires applicants and licensees to develop and maintain an emergency plan that provides reasonable assurance of adequate protective measures will be taken in a radiological emergency.



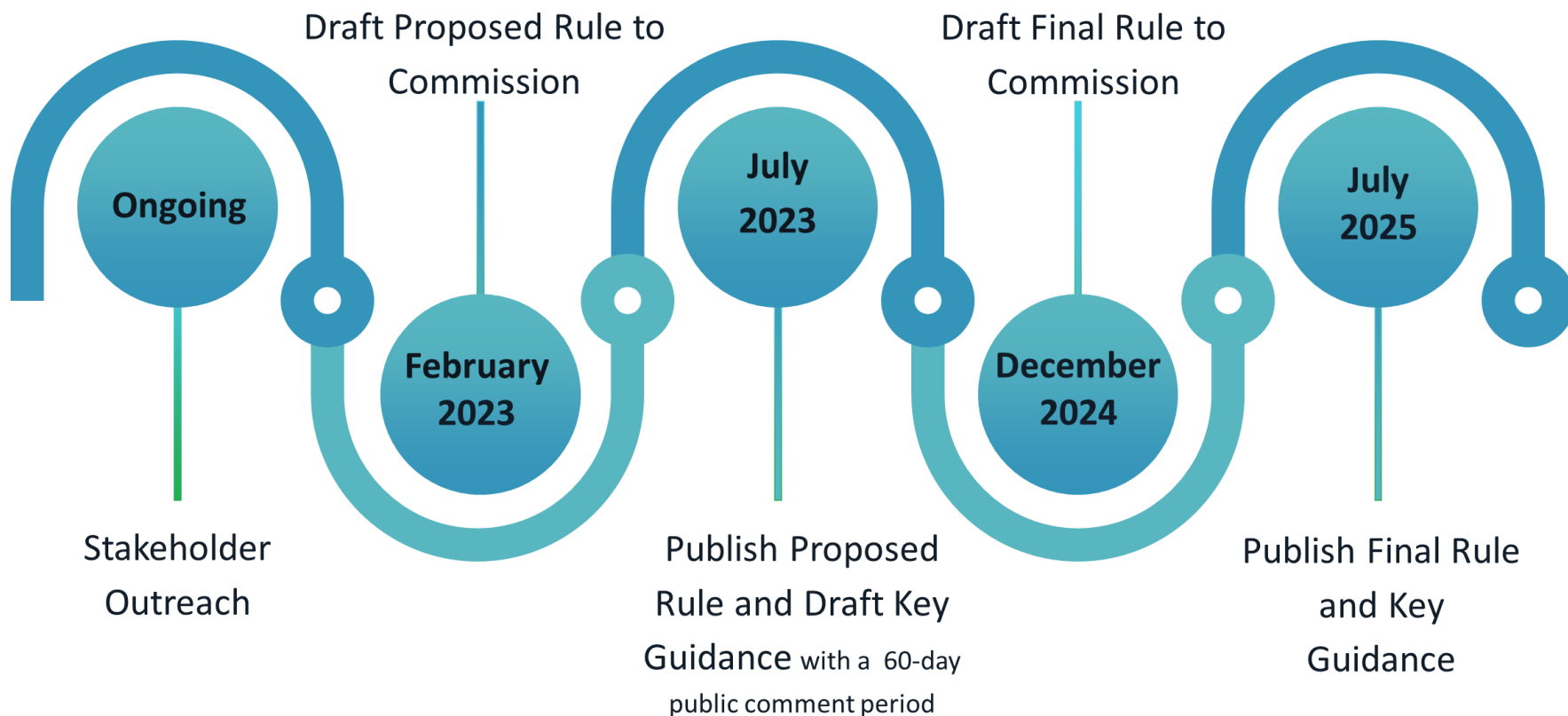
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## Other Ongoing Advanced Reactor Activities to be Included in Part 53: Siting

- Some interest by the U.S. Department of Energy and stakeholders to evaluate current siting guidance developed for large light water reactors
- Staff provided SECY-20-0045, “Population-Related Siting Considerations for Advanced Reactors,” with options related to guidance on population densities (currently 500 persons per square mile to 20 miles) and paper remains under Commission review  
(<https://www.nrc.gov/docs/ML2120/ML19262H055.html>)
  - Options include consequence dependent approach similar to that being considered for emergency planning zones

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# Part 53 Rulemaking Schedule



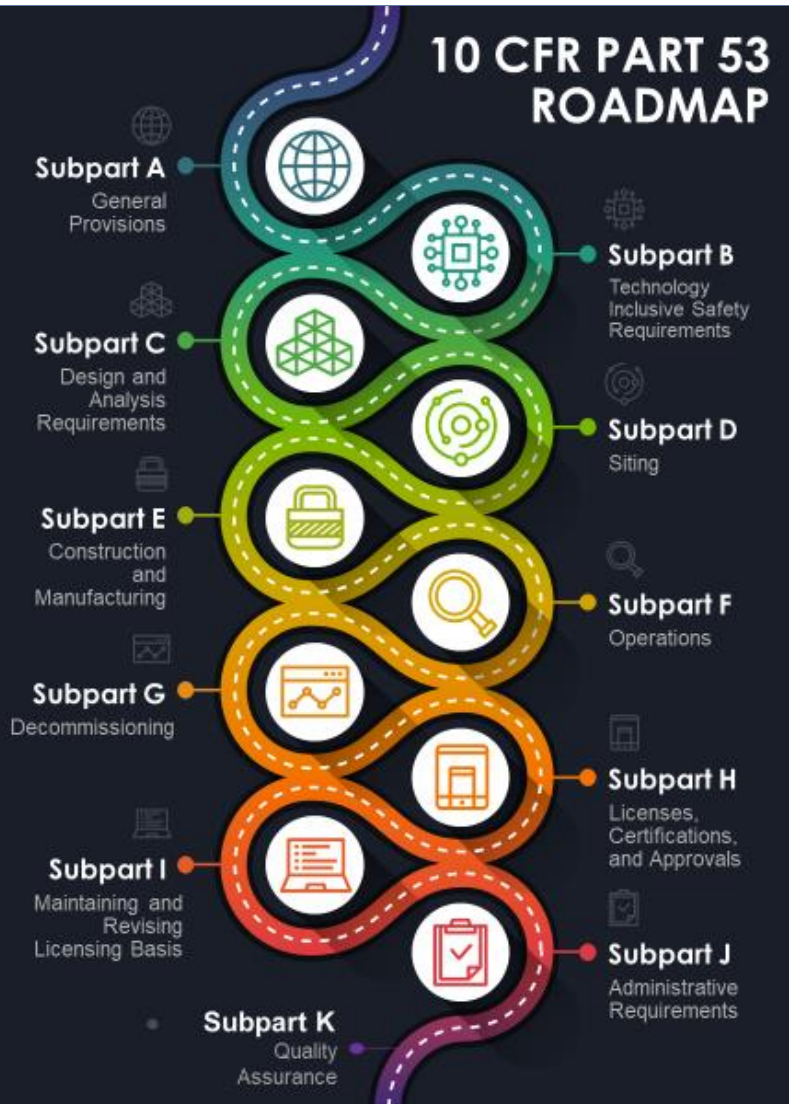
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## Part 53 Rulemaking Objectives

1. Continue to provide reasonable assurance of adequate protection of public health and safety and the common defense and security,
2. Promote regulatory stability, predictability, and clarity,
3. Reduce requests for exemptions from the current requirements in 10 CFR Part 50 and 10 CFR Part 52,
4. Establish new requirements to address non-light-water reactor technologies,
5. Recognize technological advancements in reactor design, and
6. Credit the response of advanced nuclear reactors to postulated accidents, including slower transient response times and relatively small and slow release of fission products.



# Part 53 Overview



Part 53 rulemaking addresses plant **lifecycle** with appropriate flexibilities and safety focus

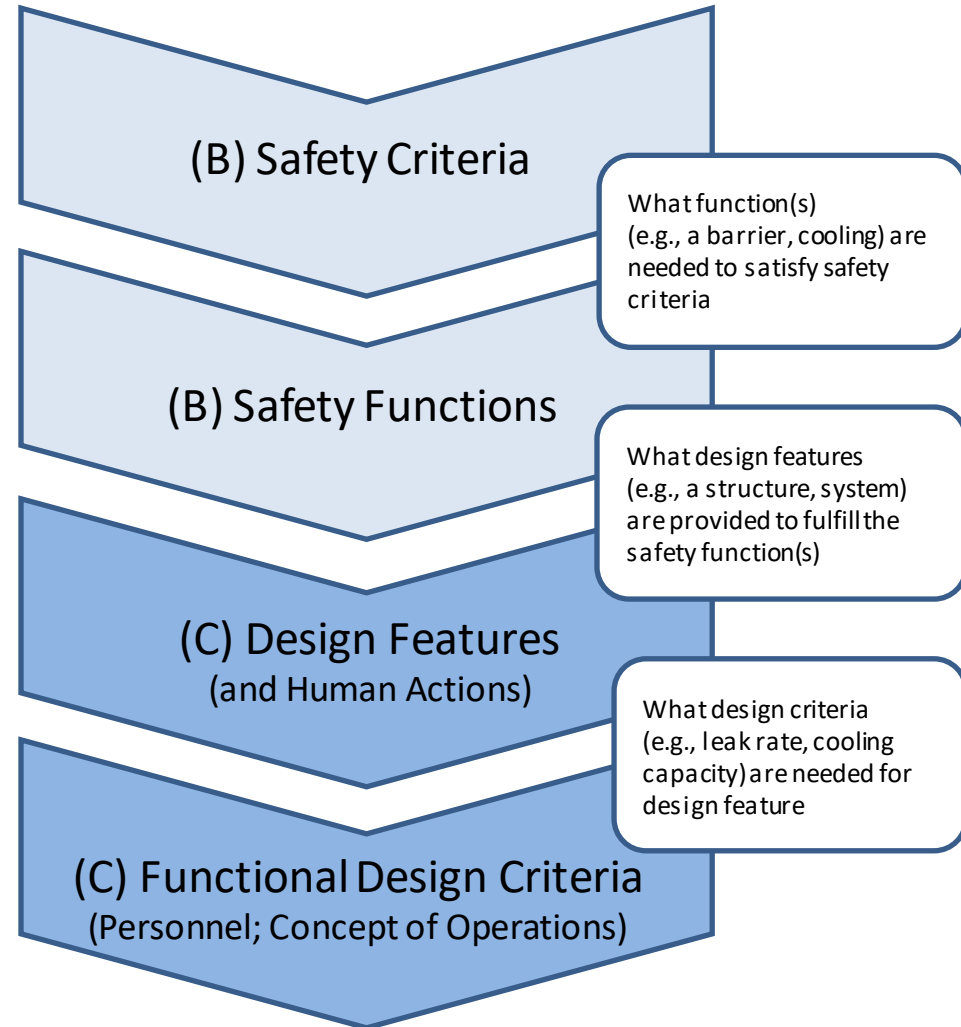
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# Subpart A – General Provisions

- This subpart includes sections related to topics such as scope, definitions, interpretations, relationships to other parts, communications, misconduct, employee protections, and exemptions.
- Most sections in this subpart were developed based on similar or identical requirements in existing parts of NRC regulations.

# Subpart B - Technology-Inclusive Safety Requirements

- Safety Objectives
- Safety Criteria
- Safety Functions
- Licensing Basis Events
- Defense in Depth
- Normal Operations and Protection of Plant Workers



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# Subpart C - Design and Analysis Requirements

- Includes requirements for identification of Design Features and Functional Design Criteria as well as specific design requirements (e.g., using of consensus codes and standards, considering degradation mechanisms, achieving subcriticality, providing long-term cooling, earthquake engineering).
- Includes analysis requirements (e.g., use of a probabilistic risk assessment, qualification of analytical tools) and requirements related to the safety categorization and treatment of plant equipment.
- Addresses how safety margins in the design can be balanced with flexibilities during operations.

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# Subpart D – Siting Requirements

- Addresses requirements associated with the siting of commercial nuclear plants.
- Establishes the overall siting-related considerations in relation to the safety criteria in Subpart B and interfaces with the design (e.g., external hazards).
- Recognizes that some applicants may propose designs that would allow them to essentially collapse the exclusion area and low population zone to the site boundary by demonstrating that the design basis accident does not challenge the dose-related criteria in this section (incorporating concepts in SECY-20-0045).

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# Subpart E - Construction and Manufacturing Requirements

- This subpart addresses requirements for the construction of a commercial nuclear plant and the possible factory fabrication of reactors using a manufacturing license.
- The preliminary language for construction-related activities reflects current requirements without any fundamental changes.
- The preliminary language for manufacturing activities largely mirrors the construction-related activities.



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# Subpart F - Requirements for Operation

- Defines the requirements during the operating phase of a commercial nuclear plant to ensure the safety criteria design & analysis requirements continue to be satisfied throughout the plant's lifetime
- Provides requirements on:
  1. Plant equipment (e.g., configuration control, testing)
  2. Plant personnel (e.g., operator licensing, training)
  3. Plant programs (e.g., radiation protection, emergency preparedness, security)

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# Subpart G - Decommissioning Requirements

- This subpart includes requirements related to maintaining financial assurance for decommissioning, requirements for transitioning from operations to decommissioning, termination of commercial nuclear plant licenses, and ultimately supporting unrestricted use of the site.
- Most sections in this subpart were developed based on the existing decommissioning requirements.
- Includes a requirement to perform site-specific cost estimates for decommissioning.

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# Subpart H - Licenses, Certifications and Approvals

- General requirements for the contents of applications for all NRC licenses, approvals, and certifications.
- Reflects existing licensing processes in 10 CFR Parts 50 and 52.
- Application requirements tailored to match Part 53 technical requirements.

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# Subpart I - Maintaining and Revising Licensing Basis Information

- Subpart I and some provisions within Subpart H define the requirements and processes for maintaining licensing basis information.
- The subpart is generally organized into those sections dealing with (1) licensing basis information that licensees are not authorized to change without NRC approval (e.g., licenses, regulations) and (2) licensing basis documents that licensees may change if specified criteria are satisfied.

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# Subpart J - Reporting and Other Administrative Requirements

- This subpart includes sections related to ensuring that NRC inspectors have unfettered access to sites and facilities licensed or proposed to be licensed, maintaining records and making reports to the NRC, meeting financial qualification and reporting requirements, and obtaining and maintaining required financial protections in case of an accident
- Most sections in this subpart were developed based on similar or identical requirements in existing parts of NRC regulations.

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# Subpart K – Quality Assurance Criteria

- Requirements related to quality assurance are similar to current requirements in Appendix B to Part 50



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## Part 53 – Framework B (formerly Part 5X)

- Consideration of stakeholder requests for an option for a more traditional, deterministic licensing framework for advanced reactors
- Provides technology-inclusive alternatives to light water reactor-centric requirements in Part 50
- Aligns with international standards (i.e., IAEA)
- Developing guidance for systematic searches for hazards, initiating events, and accident scenarios
- Includes alternative to PRA for gaining risk insights

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# Part 73 Security and Part 26 Fitness for Duty

- § 73.100 – Physical security requirements at nuclear plants against radiological sabotage
- § 73.110 – Technology neutral requirements for protection of digital computer and communication systems and networks
- § 73.120 – Access authorization
- 10 CFR Part 26 – Fitness for duty programs

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# Next Steps—Future Public Meetings

- The staff will continue to announce public meetings to discuss and receive feedback on various regulatory topics and preliminary proposed rule text.
  - March 29, 2022 – Discussion of key topics related to Part 53
  - Spring/Summer, 2022 – Framework B preliminary proposed rule language; next iteration of Framework A
  - Preliminary proposed rule text will be posted on regulations.gov under docket ID NRC-2019-0062 before the public meetings and in ADAMS at ML20289A534.
- Stay informed! Subscribe to GovDelivery:  
<https://service.govdelivery.com/accounts/USNRC/subscriber/new>

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# Final Discussion and Questions



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# Closing Remarks

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Regulations.gov docket ID: **NRC-2019-0062**

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# Acronyms and Abbreviations

ADAMS	Agencywide Documents Access and Management System
ARCAP	Advanced reactor content of application project
CFR	Code of Federal Regulations
GEIS	Generic environmental impact statement
IAEA	International Atomic Energy Agency
MWt	Megawatt thermal
NEIMA	Nuclear Energy Innovation and Modernization Act
NUREG	NRC technical report designation
RG	Regulatory guide
SECY	Office of the Secretary
TICAP	Technology-inclusive content of application project



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# Background Slides

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# Other Ongoing Advanced Reactor Activities

## Fusion

- NEIMA also addresses fusion energy systems
- Commission directed NRC staff to develop options on the licensing and regulating fusion energy systems
- NRC staff interacting with stakeholders
  - Agreement states
  - International bodies
  - Industry and public
- Commission paper with options planned for late 2022
  - Utilization facility (reactor) framework
  - Material licensing (Part 30) framework
  - Hybrid approach

# Leveraging and Combining Existing Licensing Processes

