

DOE:NE Regulatory Framework Modernization

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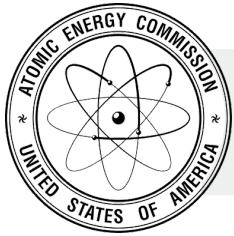
Idaho National Laboratory



U.S. DEPARTMENT
of **ENERGY**

Office of
Nuclear Energy

Nuclear Regulatory History



Commercial Nuclear Included



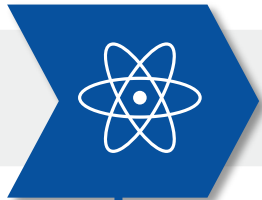
Commercial Regulation



Merged



Research & Development Promotion



1946

Atomic Energy Act (AEA) of 1946

Created the U.S. Atomic Energy Commission (AEC) to manage nuclear energy; places control under civilian authority.



1954

Revised Atomic Energy Act

Allowed for commercial nuclear power development and private sector participation, regulated by the AEC.



1957

Price-Anderson Act

Price-Anderson Act passed in the U.S., providing a liability framework for nuclear accidents.



1974

Energy Reorganization Act

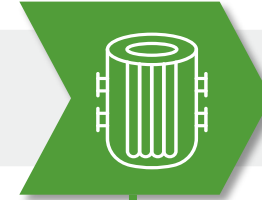
Dissolved the AEC, created the NRC to regulate nuclear safety and the ERDA to manage nuclear R&D (later merged into the DOE).



2005

Energy Policy Act of 2005

Expanded NRC authority to support new reactor licensing, and reauthorized Price-Anderson.



2020 - Present

Advance Reactors and Regulatory Modernization

Renewed focus on advanced and small modular reactors; NRC streamlining regulations to support deployment and fuel management.



2025 Executive Orders

- **Reform of the NRC**

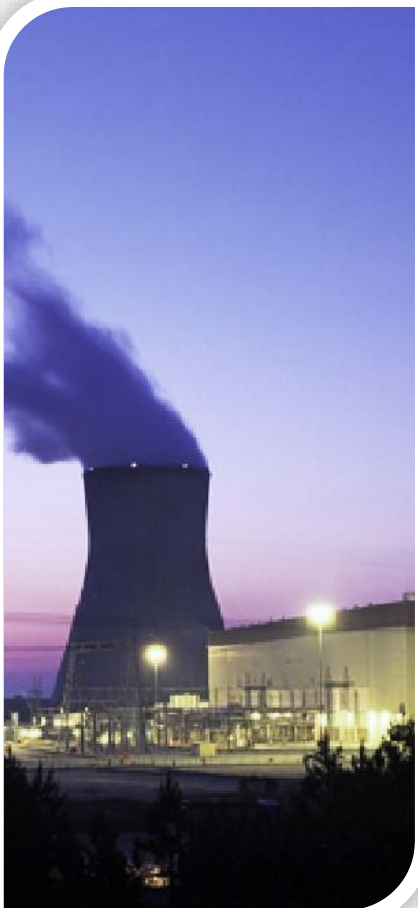
- Directs the NRC to complete rulemakings within 18 months to comprehensively revise its regulations and guidance documents
- Directs the NRC to reform its culture and realign its organization to reflect Congress' directive to rapidly promote nuclear power while ensuring reactor safety

- **Reforming Reactor Testing at DOE**

- Executive Order to reform and streamline National Laboratory processes for reactor testing
- Establishing a pilot program outside the national laboratories
- Streamlining environmental reviews



NRC Licensing Pathways



10 CFR Part 50
(All but two commercial reactors)

CP Construction Permit

OL Operating License

10 CFR Part 52
(Vogtle Units 3 & 4)

DC Design Certification

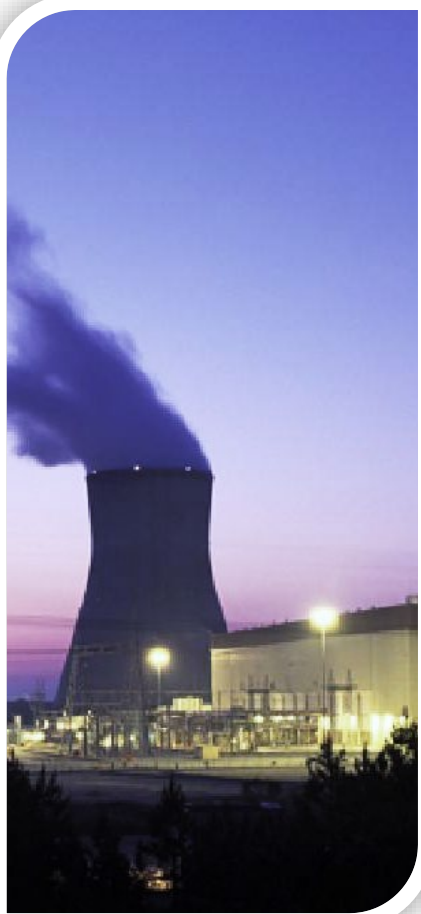
ESP Early Site Permit

COL Combined License

ML Manufacturing License

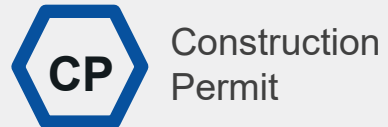
NRC Licensing Pathways

Published
April 2026



10 CFR Part 50

(All but two commercial reactors)



10 CFR Part 52

(Vogtle Units 3 & 4)

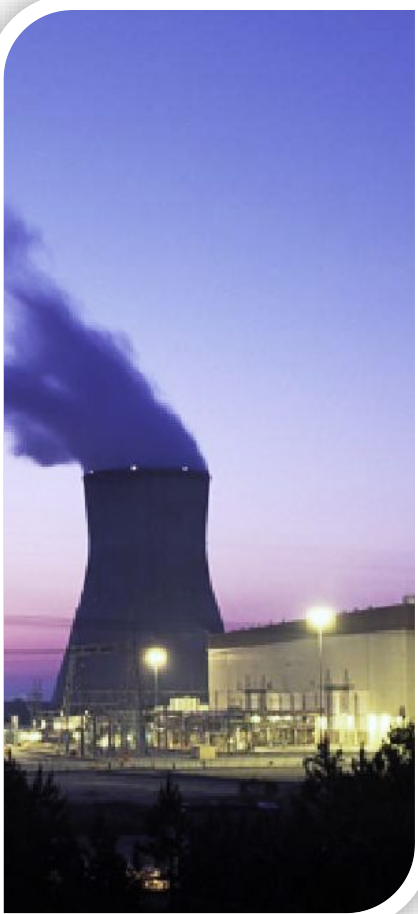


10 CFR Part 53



Risk Informed,
Technology-Inclusive
Regulatory Framework
for Advanced Reactors

NRC Licensing Pathways



10 CFR Part 50
(All but two commercial reactors)

CP Construction Permit

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10 CFR Part 53



Risk Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors

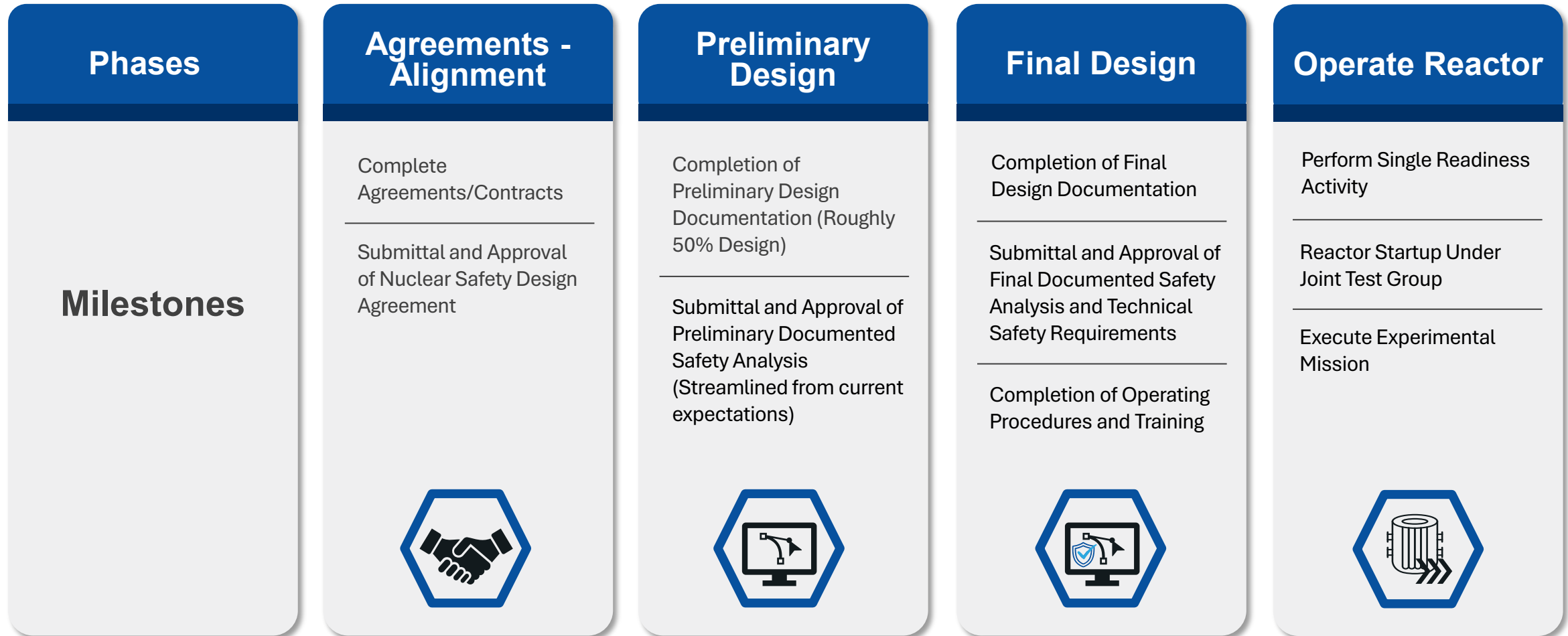
Draft Released April 2026

10 CFR Part 57



Low Dose Consequence Licensing for High Volume Licensing

DOE-NE-STD-1271 Process Overview







Mission Statement, Vision & Core Values

MISSION STATEMENT

To accelerate the safe and timely deployment of innovative nuclear technologies by developing modern regulatory frameworks, tools, and guidance – built through national laboratory, industry, and government collaboration. Our work fosters rigorous technical excellence and unwavering integrity, building the public trust necessary to advance America’s energy and national security mission.

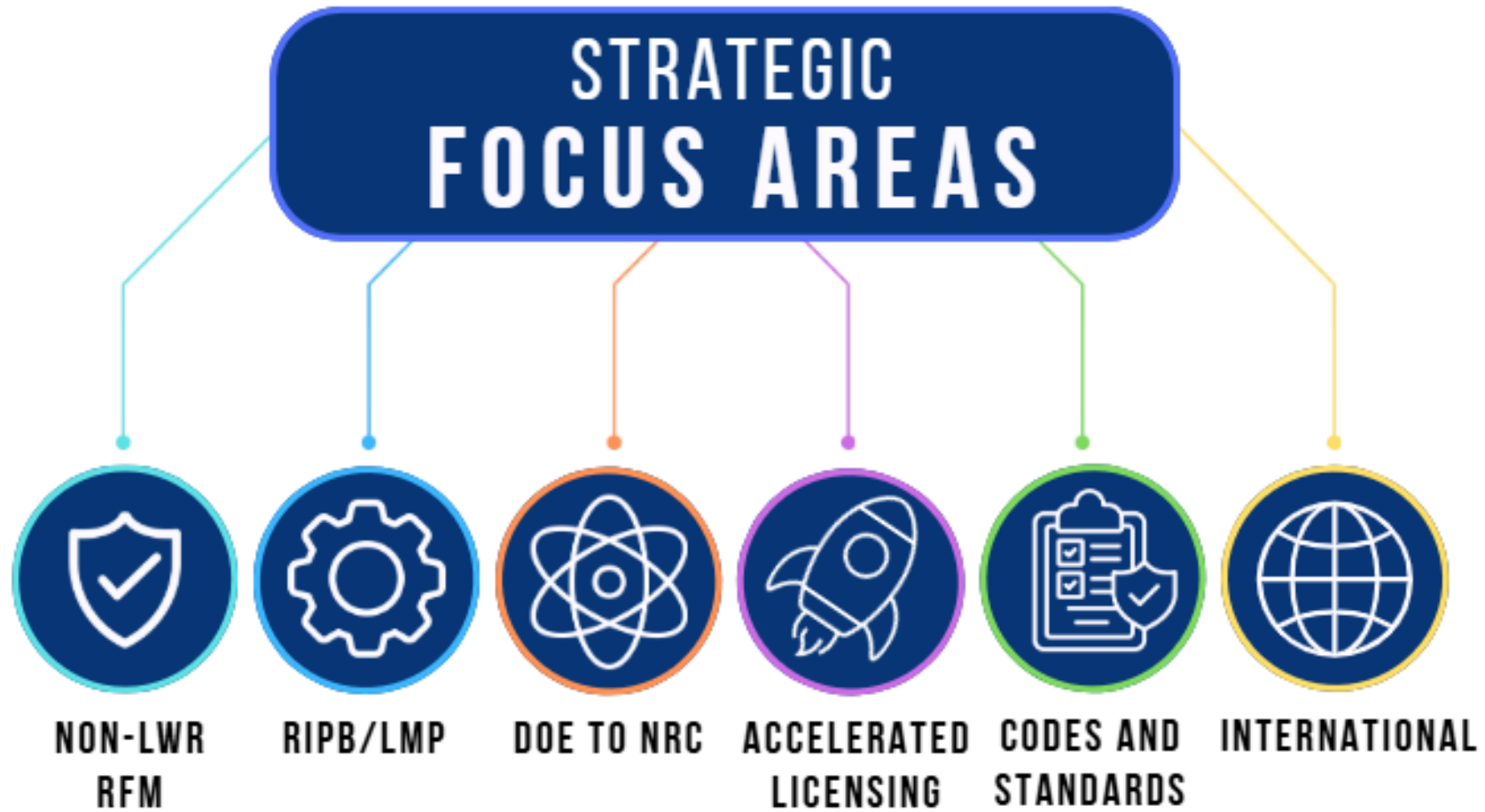
CORE VALUES

-  Integrity, Safety and Security
-  Technical Excellence
-  Collaboration and Integration
-  Adaptability and Responsiveness

VISION STATEMENT

Be the nation’s trusted hub for regulatory development that supports innovation in advancing nuclear; delivering flexible, risk informed guidance and tools that accelerate licensing and standards adoption, strengthen public trust, and align DOE, NRC, industry, and stakeholders towards timely, safe deployment.

Strategic Focus Areas



Projects: DOE Authorization to NRC License Transition

- **Reactors and Fuel Cycle Facilities**
 - Responding to executive order
 - Facilitating a seamless transition from DOE authorization to NRC commercial licenses, including new DOE:NE authorization approach
 - Key aspect of DOE:NRC MOU and collaborating with NRC staff
 - Comparing regulatory requirements to identify synergies and differences
 - **Upcoming report, complementary to NRC ISG, with additional detailed assessment**



Projects: Licensing Modernization Project (LMP)



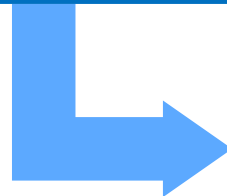
Licensing Modernization Project: Methodology for establishing a risk-informed, performance-based safety case for a non-light water reactor. (NRC endorsement via RG 1.233)



Technology Inclusive Content of Application Project: Documentation of portions of the Safety Analysis Report (SAR) content for applicants using LMP. (NRC endorsement via RG 1.253)



Technology Inclusive Risk Informed Change Evaluation: Criteria for determining if prior NRC approval is required for changes for a licensee using LMP and TICAP. (Submitted to NRC under NEI 22-05)



Technology Inclusive Management of Safety Case: Clarity on how to manage portions of the Safety Case (e.g. PRA change control, changes to understanding of plant states) is needed. (Ongoing FY26 Activity)

Projects: Emergency Preparedness

- **Risk-Informed Performance-Based EP:**

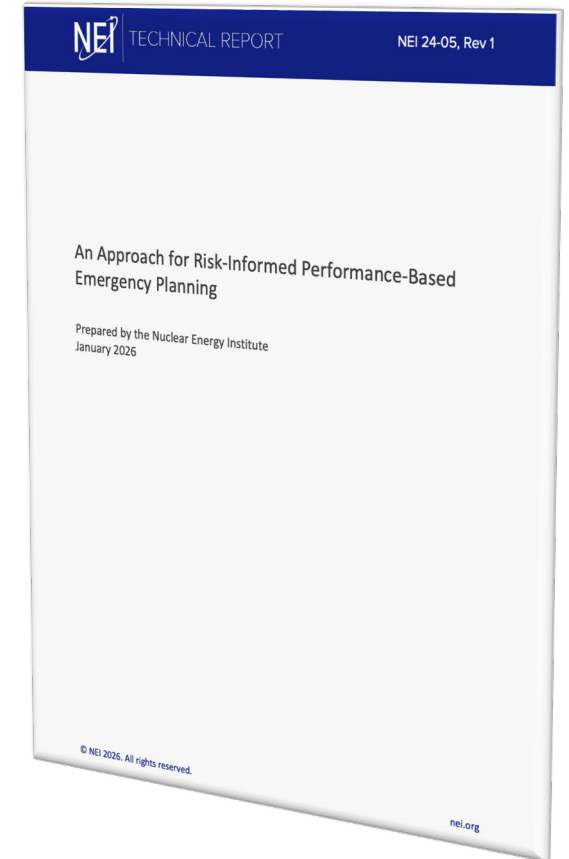
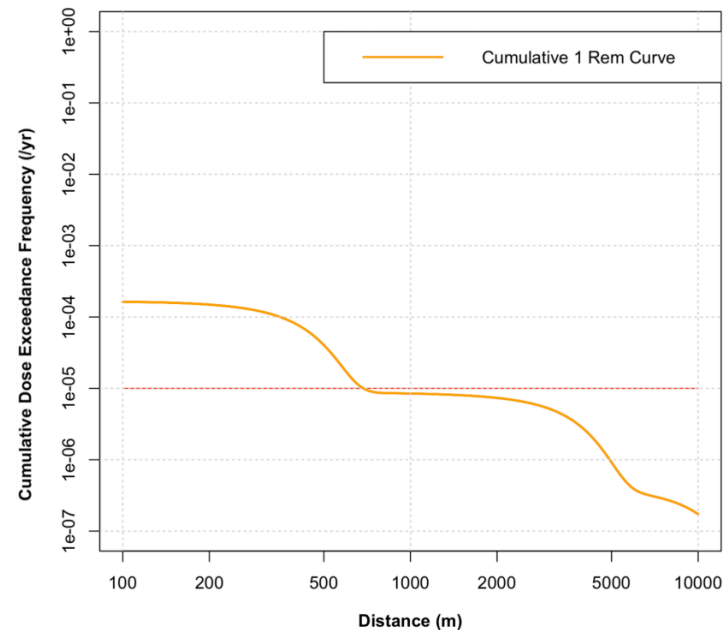
- Aligning with new NRC rule (50.160), allows right-sizing of emergency planning zone (EPZ) and EP resources

- EPZ Possibilities:

- No EPZ
- EPZ at site boundary
- EPZ beyond site boundary

- New technology- inclusive emergency classification levels

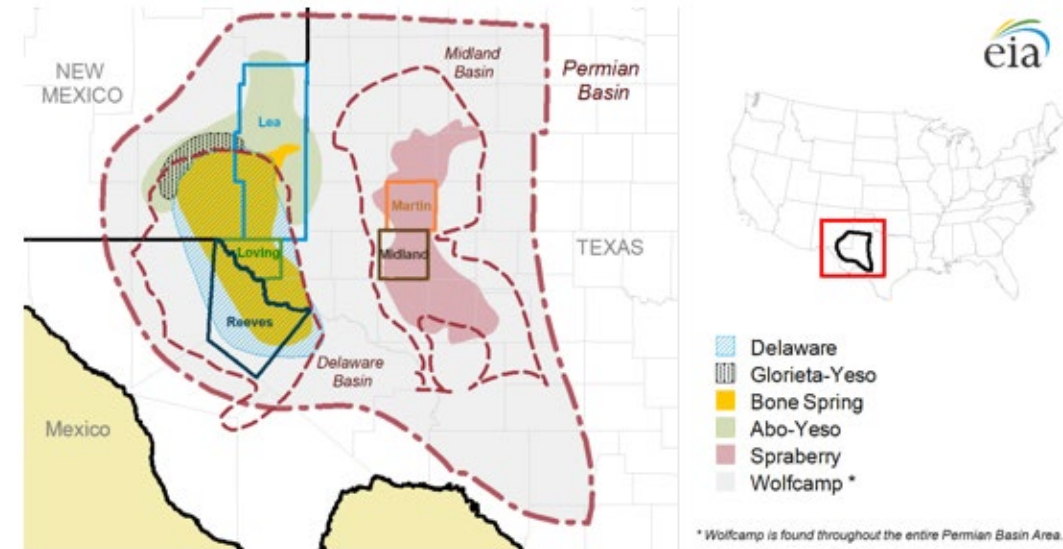
- NEI 24-05 submitted to NRC and **endorsed in April 2026**



NEI 24-05 Rev 1

Projects: Part 57 Support

- **Maximum Hypothetical Accident (MHA) Approach**
 - Detailing a methodology for developing an MHA analysis, which demonstrates satisfaction of the Part 57 entry criteria
- **Expedited Siting and Licensing**
 - Developing a site parameter envelope (SPE) to allow expedited siting of micros and SMRs over large areas, such as the Permian Basin in Texas to support oil/gas operations
 - Aligning and expanding DOE:NE siting tools to facilitate siting analyses



Projects: AI for Licensing

- **AI Tools for Commercial Licensing**

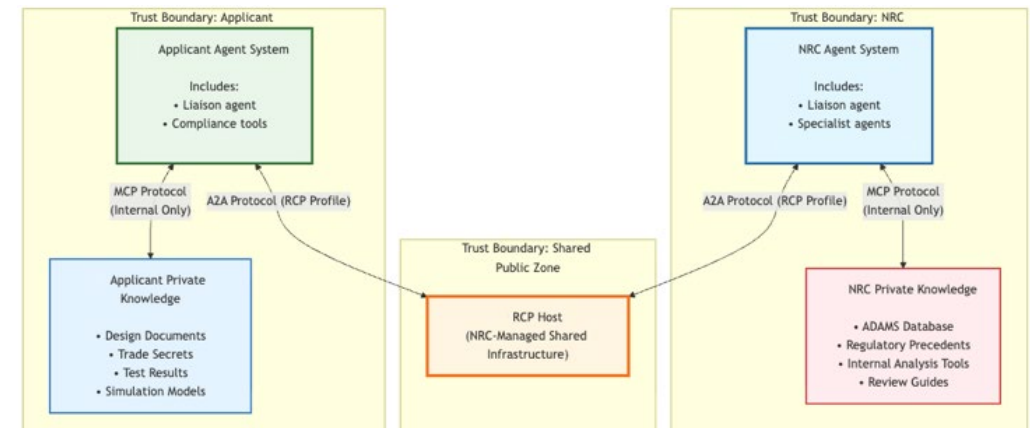
- Utilizing AI tools to automate license application development, including transition from DOE to NRC
- Collaborating with industry (Everstar Inc. and vendors) to prepare example application

- **AI Regulatory Context Protocol (RCP)**

- Facilitating communication between industry and NRC AI agents
- Expedites audits and requests for additional information

- **AI Tools for Test Reactors**

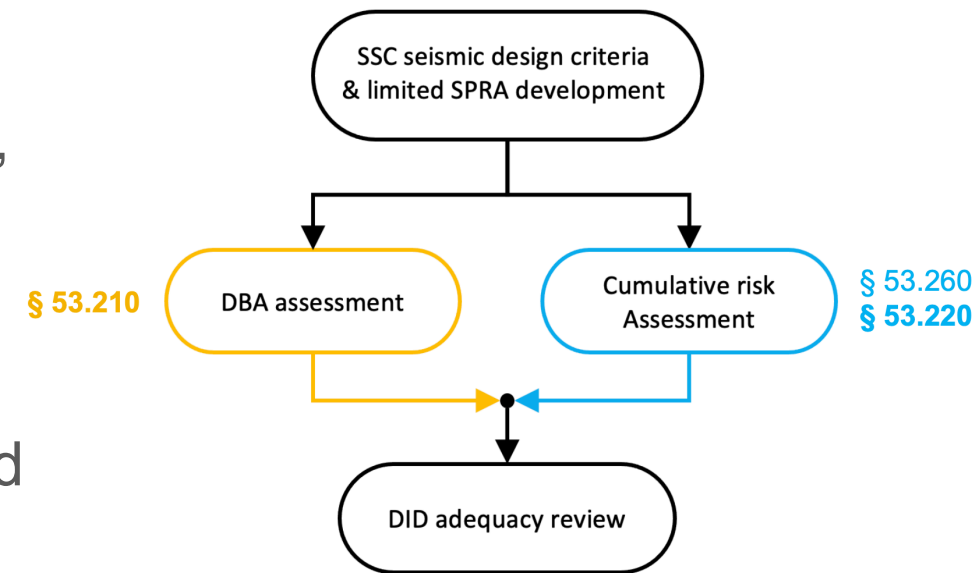
- Utilizing model-based systems approach with AI/ML knowledge management and licensing matters
- Expedite license amendment requests (LARs)



Projects: Hazards Analysis

- **Regulatory Assessment of Low Frequency Seismic Events**

- Rare external events (earthquake, flood, etc.) are difficult to assess due to uncertainty in likelihood and consequence.
- A simplified approach was developed with industry, which demonstrates adequate design margin without the need to conduct detailed assessments of severe seismic events
- Documented in upcoming NEI report, and expected to be submitted to the NRC for review in coming weeks



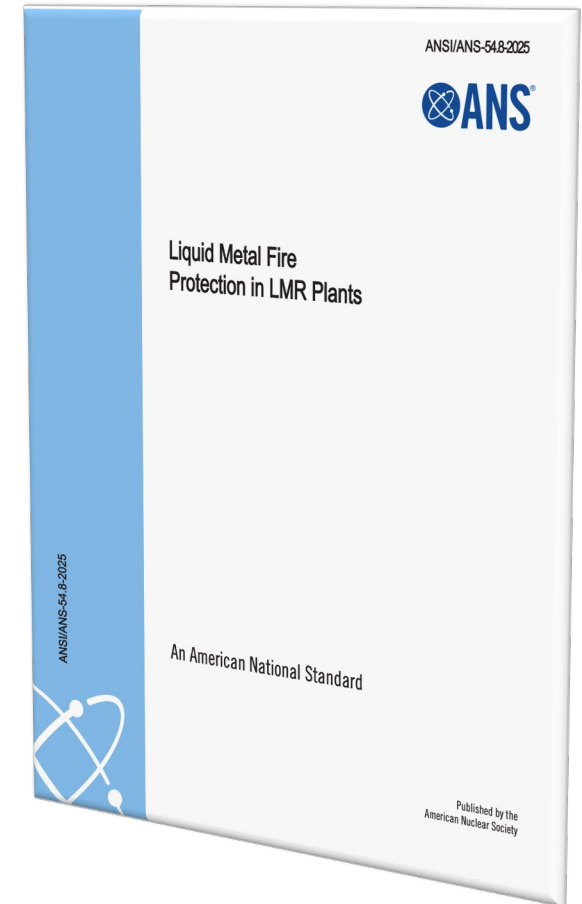
Projects: Code and Standard Support

- **Expediting C&S Development**

- Working with NRC, industry partners, and standards development organizations to identify C&Ss gaps for advanced reactors
- Collaborating with NRC to enhance the endorsement process and provide alternative pathways to use an unapproved C&S's

- **Liquid Metal Fire Protection (ANS 54.8)**

- Withdrawn in 2000, new working group established and **standard re-issued in September 2025**
- New version being prepared with optional risk-informed pathway, target late 2026 release



ANS 54.8

Projects: Regulatory Coordination and International Engagement

- **Regulatory Coordination**

- Multi-lab group that leverages national laboratory expertise to review draft regulatory items and provides comments on behalf of DOE

- **International Engagement**

- Promotes global alignment on regulatory matters, support US vendor deployment internationally
- Supports US participation in GIF Risk and Safety Working Group (RSWG) and US expert participation at IAEA and other international events





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