



U.S. Nuclear Regulatory Commission  
**34<sup>th</sup> ANNUAL REGULATORY  
INFORMATION CONFERENCE**

**MARCH 8-10, 2022**

PREPARING FOR  
**TOMORROW**

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# **Global Approaches to Small Modular Reactor and Advanced Reactor Licensing**

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## US NRC Licensing Options

<b>10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities”</b>	<b>10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants”</b>	<b>10 CFR Part 53</b>
<ul style="list-style-type: none"><li>• Construction Permit</li><li>• Operating License</li><li>• Limited Work Authorization</li><li>• Site Suitability Reviews</li></ul>	<ul style="list-style-type: none"><li>• Early Site Permits</li><li>• Standard Design Certification</li><li>• Combined License</li><li>• Manufacturing License</li><li>• Duplicate Plant License</li><li>• Standard Design Approval</li><li>• Site Suitability Reviews</li></ul>	Under Development



## **Pathway to New Regulatory Framework**

### **“Part 53” Rulemaking by July 2025**

- Nuclear Energy Innovation and Modernization Act (NEIMA) requirement
- Technology-inclusive, risk-informed and performance based regulatory framework
- Commission direction SRM-SECY-20-0032
- Builds on current activities, including the Licensing Modernization Project
- Significant stakeholder engagement



## PART 53 | TRANSFORMATIVE

Establishes a **Transformative**  
Regulatory Framework

Part 53 builds on a  
**strong foundation** of  
Commission policies and  
decisions

### Features

- Evolves use of **risk**
- Leverages **performance-based** requirements
- **Modernizes** licensing basis **change process**
- Includes **consequence-oriented** scalable requirements
- Enables operational **flexibility**
- Optimizes balance between flexibility and **predictability**





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## **Preapplication Activities to Support Licensing**

- Pre-application engagement
- NRC response to applicant's general correspondence
- NRC review of and feedback on applicant's regulatory engagement plan
- NRC assessment and response to applicant's white papers
- NRC evaluation of applicant's technical and topical reports
- Pre-application audits to support a high-quality application



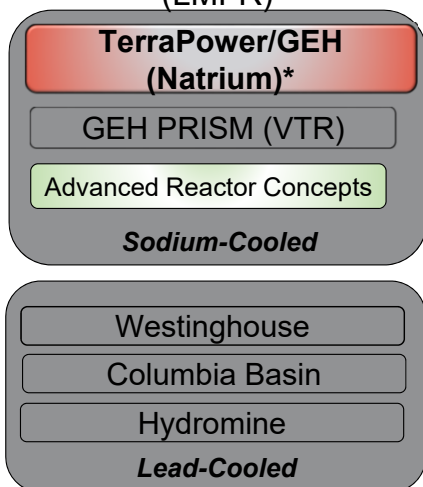
## Small Modular Reactor Designs - Current Licensing Activities

- Preapplication Engagement
  - NuScale Power standard design approval application for the NPM-20 design
  - Carbon Free Power Project combined license application for the NPM-20 design
  - GE Hitachi BWRX-300 design
  - Tennessee Valley Authority license application for the Clinch River Site
  - SMR (Holtec) SMR-160 design
- Design Certification of NuScale standard plant design
- Alignment of requirements in 10 CFR Part 50 and Part 52

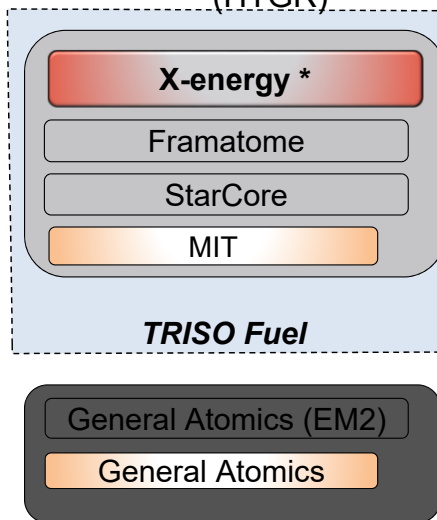


# Broad Landscape of Advanced Reactor Designs

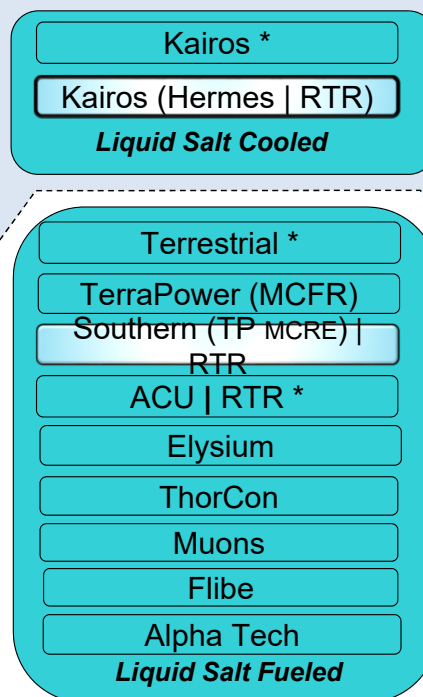
## Liquid Metal Cooled Fast Reactors (LMFR)



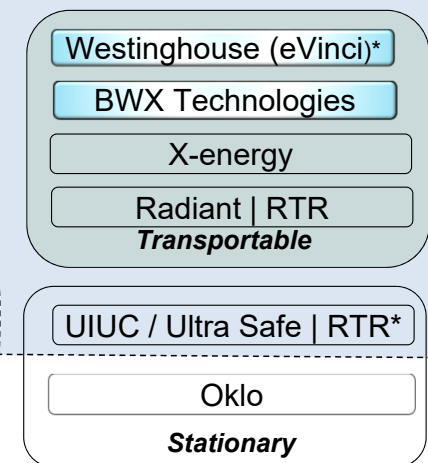
## High-Temperature Gas-Cooled Reactors (HTGR)



## Molten Salt Reactors (MSR)



## Micro Reactors



### LEGEND

ARDP Awardees

**Demo Reactors**

Risk Reduction

ARC-20



In Licensing Review

\*

Preapplication

RTR

Research/Test Reactor



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## International Regulatory Cooperation



Small Modular Reactors Regulators  
Forum

IAEA Safety Standards Committees



Committee on Nuclear Regulatory  
Activities Working Groups  
Multinational Design Evaluation  
Programme

Framework for Irradiation  
Experiments



Canadian Nuclear Safety  
Commission