

## A Perspective on Advanced Reactor Activities

**Kati Austgen**  
Sr. Project Manager, New Plant Licensing

U.S. NRC Regulatory Information Conference  
Session T1 - Advanced Reactors: NRC's Readiness  
March 14, 2017 • North Bethesda, MD




---

---

---

---

---

---

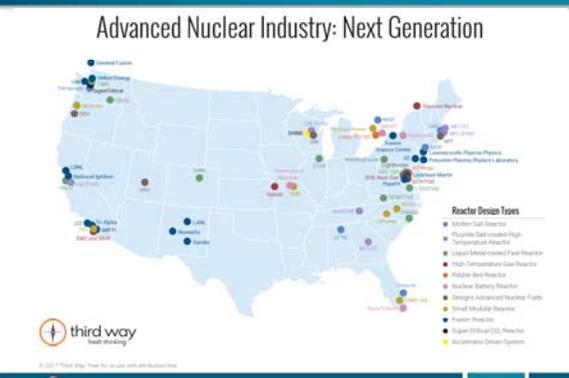
---

---

---

---

### Advanced Nuclear Industry: Next Generation






---

---

---

---

---

---

---

---

---

---

### Long-Term Vision for New Plant Commercialization

America's nuclear power plants are operating at world-class levels of safety and reliability and **by the 2030s are supplying an increasing amount of carbon-free energy** for electricity and industrial uses. **American industry maintains a leadership role** in the development, demonstration and operation of both light-water and non-light water nuclear technologies for energy production and **U.S. reactor designs are recognized as the most innovative available.**

Source: NEI Strategic Plan for Advanced Non-Light Water Reactors




---

---

---

---

---

---

---

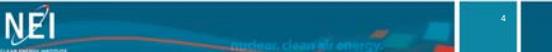
---

---

---

### NEI Strategic Plan for Advanced Non-Light Water Reactors: Strategic Goals

1. Two or more advanced non-light water reactor designs are commercially available (ready to build) in the U.S. in the 2030-2035 timeframe.
2. Demonstrations of one or more advanced non-light water reactors occur in the U.S. by 2025.
3. A licensing framework exists to facilitate the efficient and predictable deployment of advanced technologies, provides continued international credibility to U.S. designs, and encourages continued private-sector investment.



---

---

---

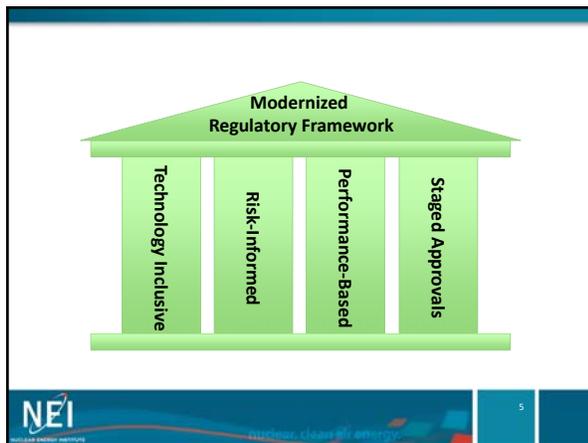
---

---

---

---

---



---

---

---

---

---

---

---

---

### NEI Advanced Reactor Activities

- Non-LWR guidance and design criteria
- Licensing Technical Requirements Modernization Project
- Standard Design Approval – “major portions” guidance
- Regulatory Engagement Planning guidance
- Codes & Standards coordination
- Standard Review Plan for Research & Test reactors (NUREG-1537)
- Update NRC criteria for research reactor (examine 1MW liquid fuel limit)
- Issues specific to uranium enrichments between 5% and 20%



---

---

---

---

---

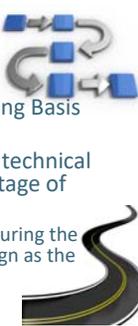
---

---

---

**Licensing Technical Requirements Modernization Project**

- Technology-inclusive, Risk-informed, Performance-based
- Propose systematic process for Licensing Basis Event Selection
- Propose an approach to ensuring PRA technical adequacy (“Fit for Purpose”) at each stage of design and licensing
  - Provide roadmap for integrating and maturing the PRA and using as additional input to design as the design matures



NEI

---

---

---

---

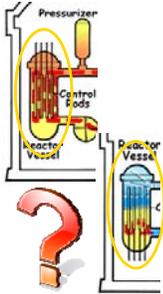
---

---

---

---

**Standard Design Approval “Major Portions” Guidance**



- *Standard design approval...* means an NRC staff approval... of a final standard design for a nuclear power reactor... The approval may be for either the final design for the entire reactor facility or the final design of **major portions** thereof.
- Part of staged application review & approval

NEI

---

---

---

---

---

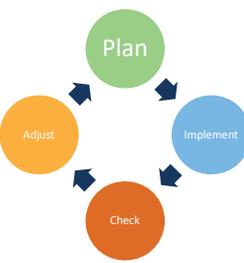
---

---

---

**Regulatory Engagement Planning Guidance**

- Pre-application thru chosen regulatory outcome(s)
- “User’s guide” reference to current guidance
- Examples of successful approaches/techniques
- Menu-style template



NEI

---

---

---

---

---

---

---

---

**2019 AND BEYOND**  
**FOUR REACTORS UNDER CONSTRUCTION**  
The long-term dynamics of rising electricity demand, more stringent clean air requirements, and concerns about U.S. energy security remain drivers for nuclear energy expansion.

South Carolina V.C. Summer 2 and 3  
Georgia Vogtle 3 and 4

**MID-2020s AND BEYOND**  
**SMALL MODULAR REACTORS (SMRs)**  
These reactors are light water designs, much the same as the current generation but typically with a generating capacity of fewer than 300 megawatts.

NuScale SMR  
TVA Clinch River Project

**2030s AND BEYOND**  
**LIQUID METAL, MOLTEN SALT, AND HIGH TEMPERATURE GAS REACTORS**  
Almost 60 companies and research institutions are developing advanced reactors for a wide array of capabilities to meet the energy needs of the future.

Terrestrial Energy (MSR)  
X-energy HTGR

**NEI**  
Nuclear Energy Institute  
SUSTAINABLE, CLEANER AIR, ENERGY

10

---

---

---

---

---

---

---

---