

PRESENTED BY: MICHAEL WENTZEL

A laptop is open on a light-colored wooden table. The laptop screen shows a presentation slide with a circular profile picture of a woman on the left and a map of the United States on the right. To the right of the laptop is a stack of four books. The top book has a white cover with a red stripe. The second book has a dark cover with a white crescent moon. The third book has a dark cover with a white crescent moon. The bottom book has a teal cover with a white logo. The background is dark and out of focus, showing a white mug and a chair.

Nuclear Regulatory Commission

Advanced Reactors

Our Vision

Creating new
paradigms to make
SAFE
use of nuclear
technology
POSSIBLE

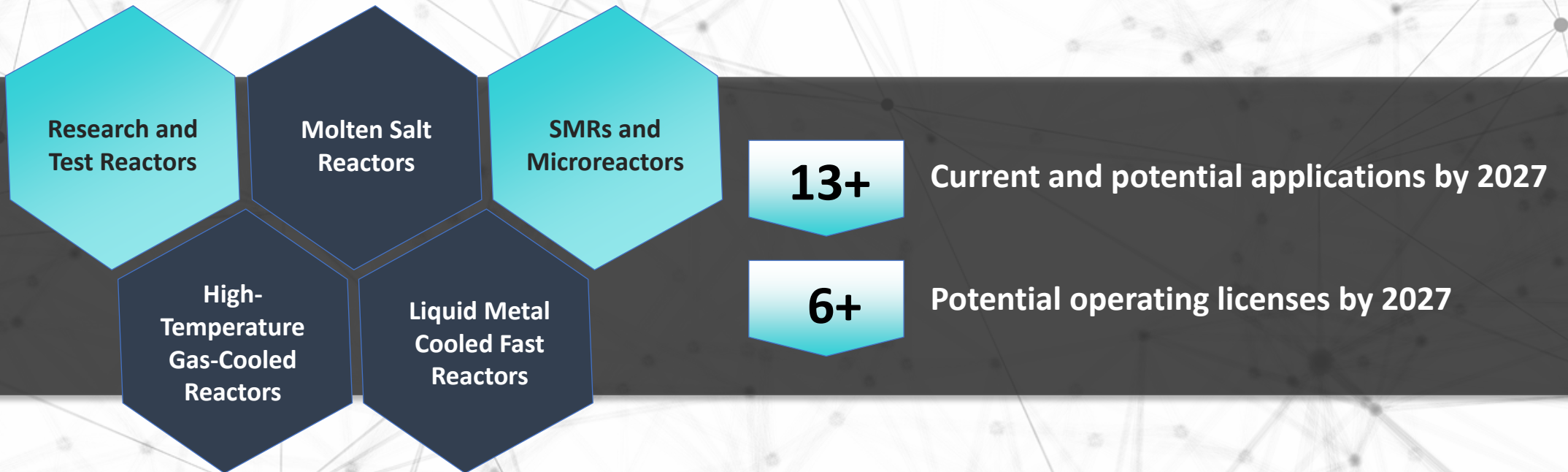


An aerial, top-down view of a dense forest. The trees are dark green and appear as a textured canopy. A road or path winds through the forest, crossing a small bridge or structure in the lower center. The overall lighting is dim, giving the scene a dark, moody atmosphere.

LICENSING STATUS

NRC is Preparing for an Increase in SMR and Advanced Nuclear Technology Licensing

EVOLVING LANDSCAPE



15+ Entities actively engaged in pre-application activities

51 Topical reports and white paper reviews completed for 7 vendors

28 Topical reports and white papers under evaluation from 8 vendors

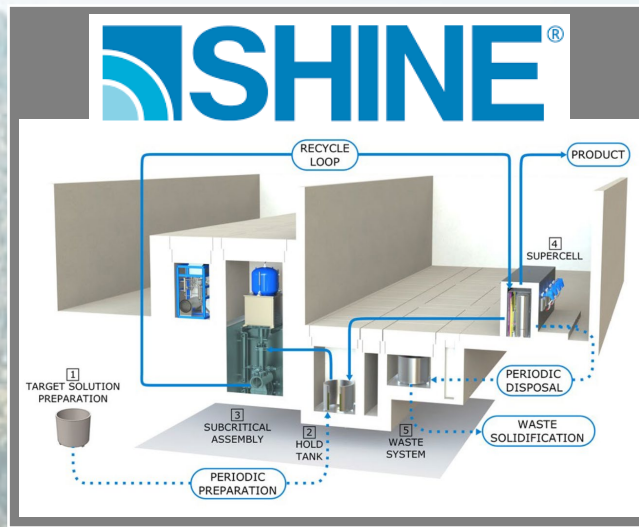
NRC is Engaged with Vendors at Various Steps of the Licensing Process

License Reviews in Progress

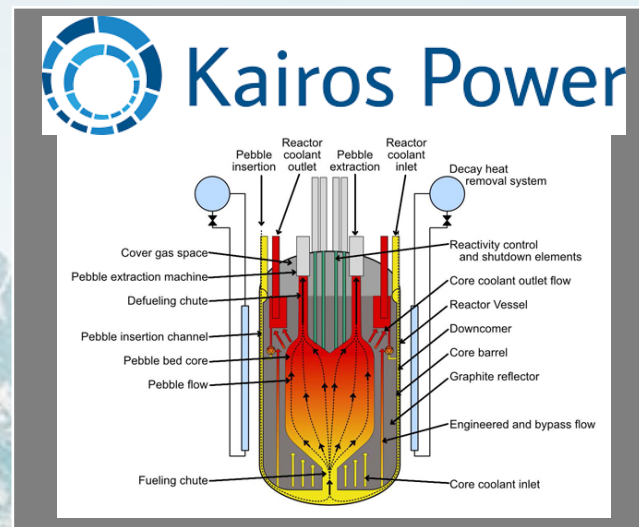


Ongoing Pre-Application Activities

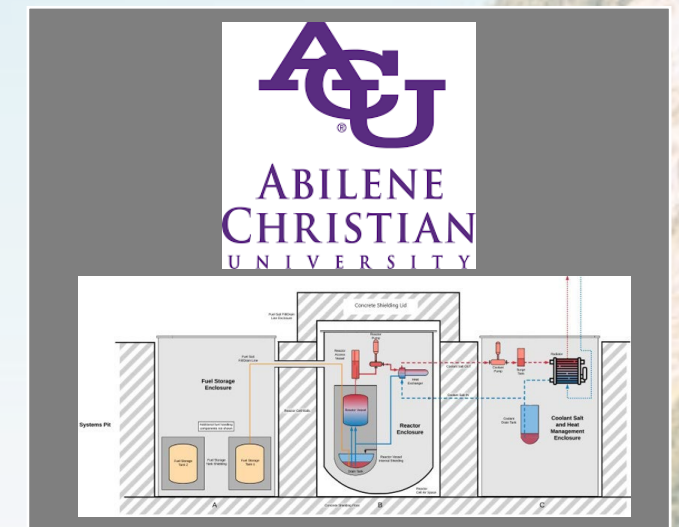




- Molybdenum-99 (and other medical isotopes) production facility
- Neutrons created by an accelerator-driven neutron source induce fission in the LEU, creating Mo-99 as a byproduct
- Site is currently under construction in Janesville, WI
- Construction permit issued in 2016. Operating license submitted to NRC in 2019 and is currently under review.



- Hermes test reactor
- 35 MWth fluoride salt-cooled high temperature non-power reactor using TRISO-coated particle fuel in a pebble bed configuration
- Proposed location to be in Oak Ridge, TN
- Construction permit submitted to NRC in September 2021 and is currently under NRC review.



- 1 MWth, graphite moderated, fluoride salt flowing fluid (fuel dissolved in the salt) research reactor
- Proposed location to be near the ACU campus in Abilene, Texas
- Construction permit submitted to NRC in August 2022 and is currently under review.

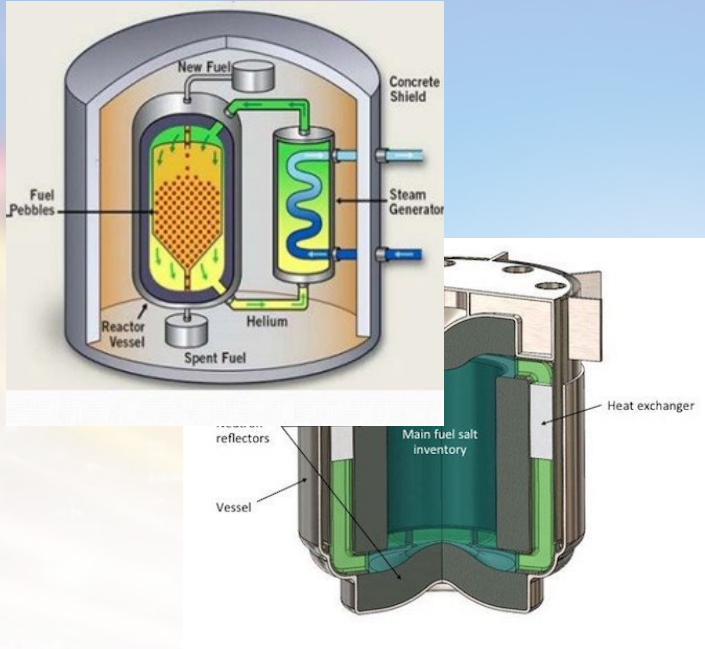
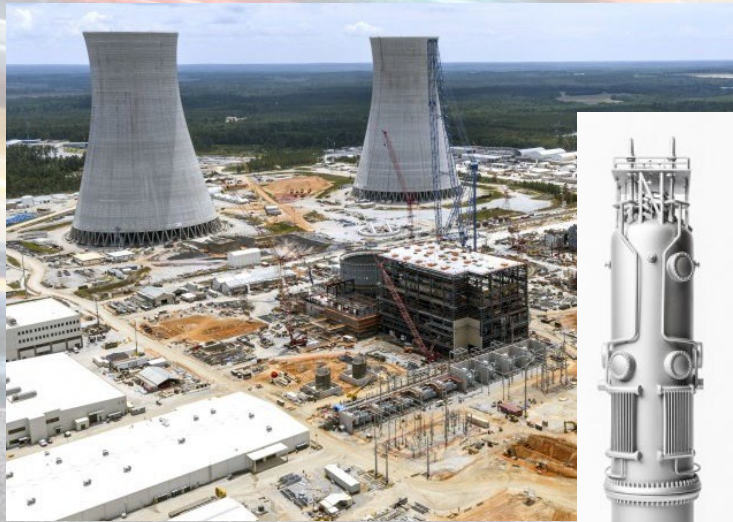
SMR and Advanced Reactor Licensing



10 CFR, Part 52

Vogtle 3&4 AP-1000, NuScale

Early Site Permit, COL, Design Certification, Manuf. License



10 CFR, Part 50

Large majority of operating power reactor and NPUF fleet

Construction Permit + Operating License

10 CFR, Part 53

New licensing framework under development

Publish by June 2025

An aerial photograph of a dense forest with a winding path, overlaid with a dark, semi-transparent filter. The text is centered in a bright cyan color.

TRANSFORMATIVE
REGULATION FOR
TRANSFORMATIVE REACTOR
TECHNOLOGY

A fountain pen with a gold nib and a dark grey barrel lies on a document with faint, illegible text. The pen is positioned horizontally across the lower left portion of the image. A teal triangle is visible in the top left corner.

Commission Policy Statement on Advanced Reactors

“the Commission expects, as a minimum, at ***least the same degree of protection*** of the environment and public health and safety and the common defense and security that is required for current generation light-water reactors (LWRs)...


the Commission expects that advanced reactors will provide ***enhanced*** margins of safety and/or ***use simplified, inherent, passive, or other innovative means*** to accomplish their safety and security functions.” (emphasis added)

Part 53 | Transformative

Establishes a transformative regulatory framework

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

- 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

A person is seen from the side, sitting at a desk and working on a laptop. The scene is dimly lit, with a window in the background showing some blurred lights. The person's hands are on the laptop keyboard. A glass of water and a dark mug are on the desk. The overall atmosphere is professional and focused.

Developing Rule Language and Polices

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- Part 53's Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors
 - Alternative Physical Security
 - Emergency Preparedness
 - Generic Environmental Impact Statement for Advanced Reactors
 - Siting
 - Fee Structure
 - Fusion
 - Oversight



THANK YOU!