



Regulatory Review Process Options: Industry Progress, Initiatives, and Concerns

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NIA Mission & Modes of Operation

The NIA leads advanced nuclear energy innovation.

- *We assemble companies, investors, experts, and stakeholders to advance nuclear energy innovation and enable innovative reactor commercialization through favorable energy policy and funding.*
- *We research, develop, and advocate policies that enable the efficient licensing and timely early-stage demonstration of advanced reactor technologies.*

NIA Strategic Priorities

- Top priorities:
 - A more technology-inclusive licensing process with optional stages
 - A test bed & demonstration platform where nuclear innovators in the private sector can demonstrate advanced technologies
- Next tier priorities:
 - Cooperation to provide for international commercial testing, demonstration, and deployment of advanced technologies.
 - Financial support for early stage technology development and early commercial deployment.

US Advanced Nuclear Energy

- Advanced nuclear energy can play a key role in achieving America's long-term energy, security, economic, and environmental goals
- The US has the leading innovators, researchers, and national labs, and a top regulator
- But if we neglect to support a viable pathway to commercialization, we will surrender our leadership and forfeit the benefits of advanced nuclear energy to other nations

Key Regulatory Challenges to Commercialization

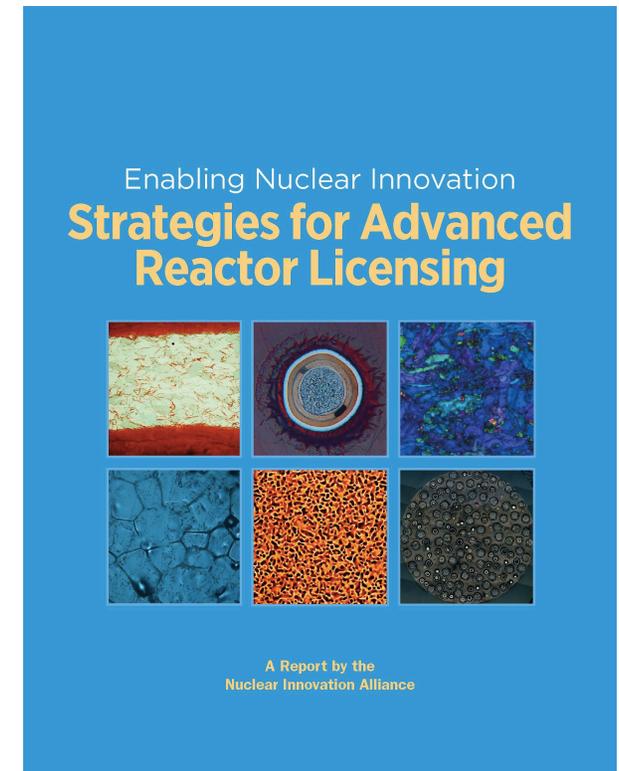
- Regulations designed for light water technologies do not easily fit advanced reactors, requiring revisions to requirements, exemptions, and high costs and long time periods interacting with the regulator.
- The licensing process requires a major investment of time and money, without interim steps that provide concrete feedback.
- Some innovators need to build a prototype or demonstration reactor, and the regulatory process is not well-charted territory.

Goal

- A process that
 - Incorporates optional discrete stages;
 - Is more predictable, efficient, and cost-effective for advanced reactors;
 - Is more technology-inclusive

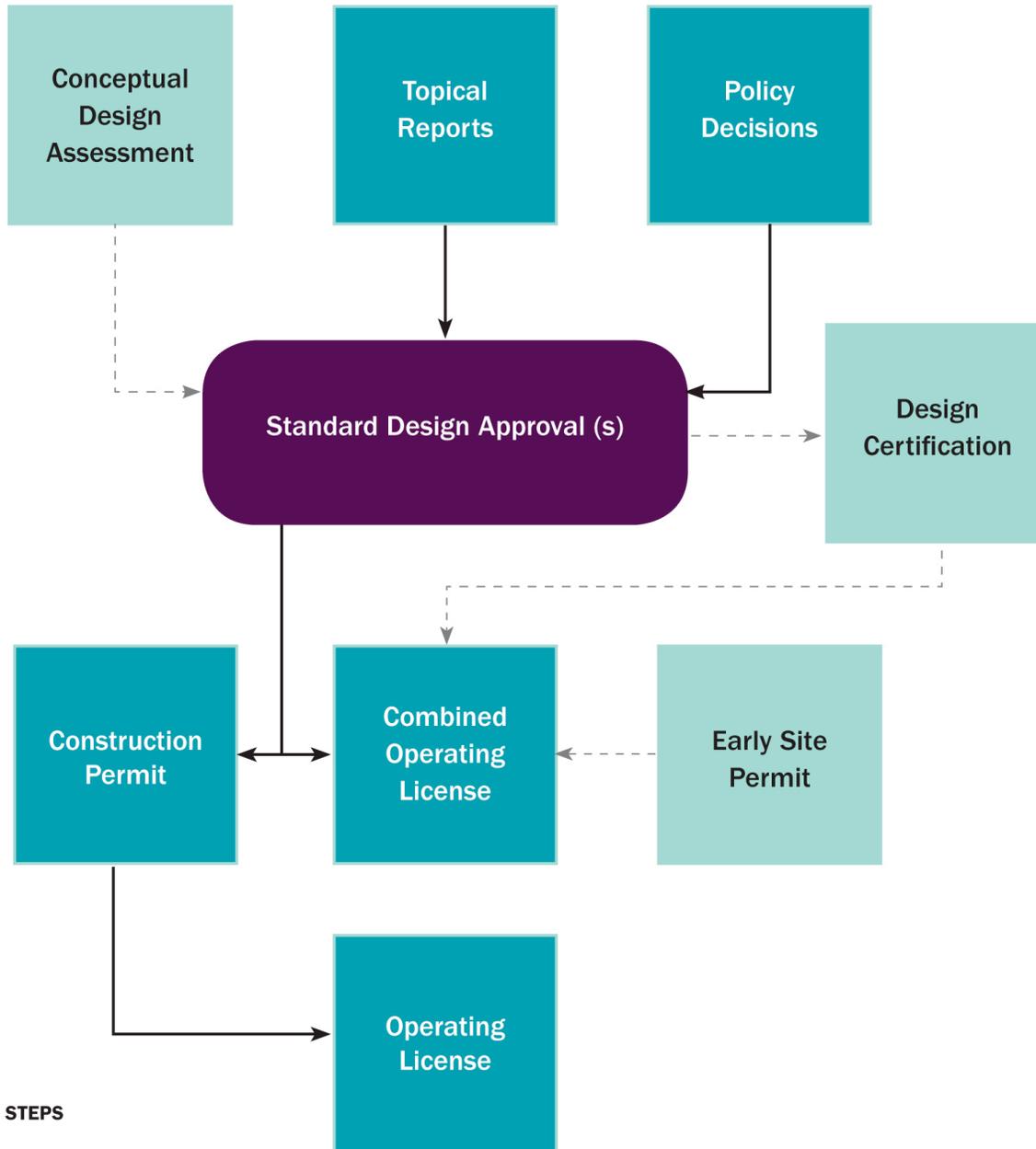
NIA Regulatory Activities

- NIA Recommendations are available in “Strategies for Advanced Reactor Licensing” report
- Current activities focus on implementation of recommendations
 - Standard Design Approval
 - Licensing Project Plan/Regulatory Engagement Plan



REGULATORY ENGAGEMENT PLAN

Elements of Staged Licensing



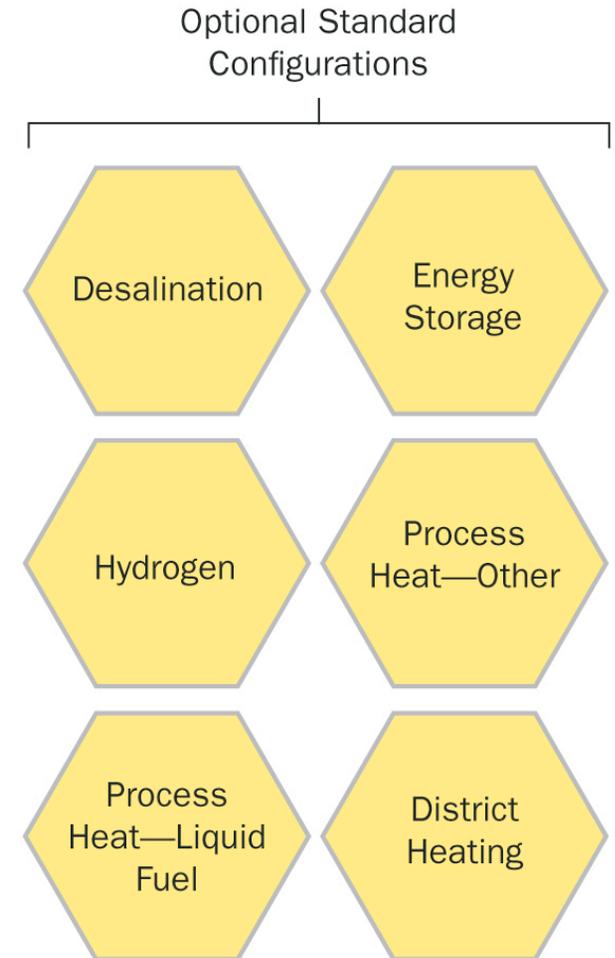
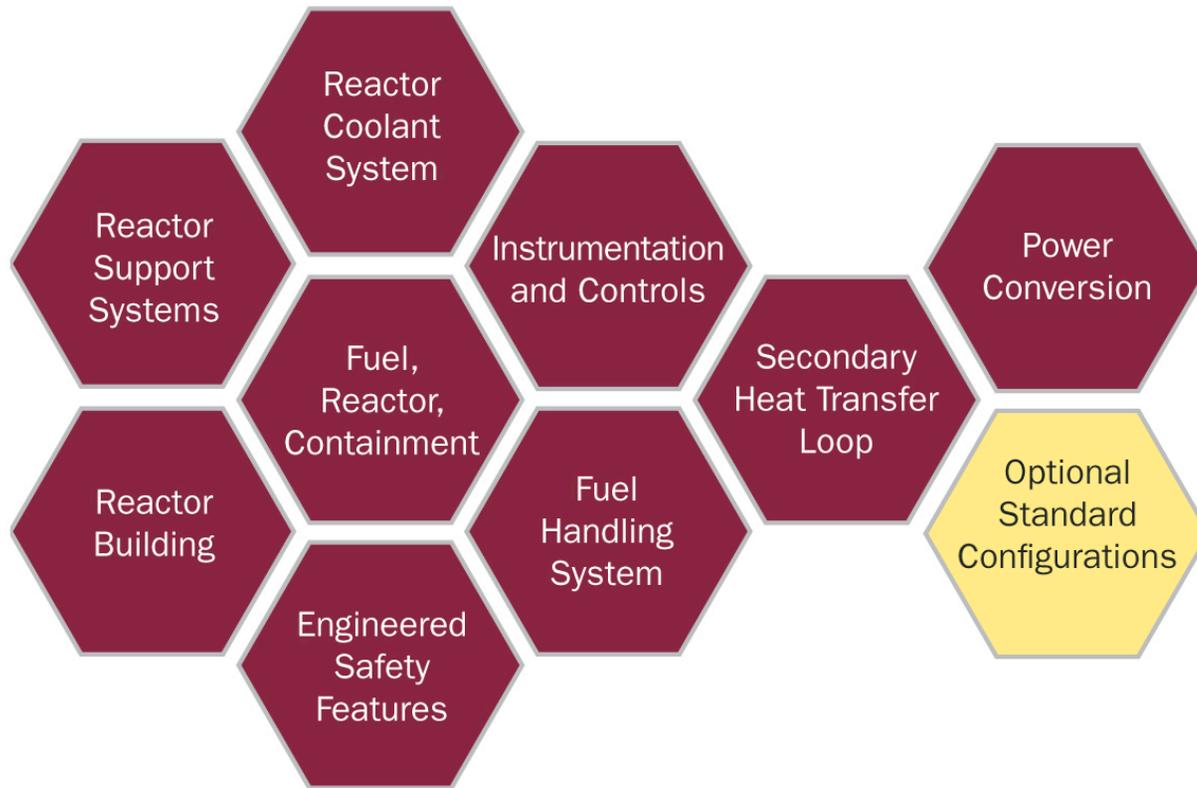
 OPTIONAL STEPS

Standard Design Approval

- 10 CFR Part 52, Subpart E allows an applicant to seek standard design approval for either an entire plant or “major portions” thereof
- NIA clarifying the meaning of “major portions” to make SDA process useful for advanced reactor developers
- Developed report for delivery to the NRC for their initial review, with input from industry representatives (and NEI/ARWG)

Flexibility of the Standard Design Approval

This figure is meant to be representative. It isn't exhaustive and is not expected to represent all possible or acceptable SDA topics.



Each of the Standard Design Approvals must satisfy the interfacing boundary conditions for safety and licensing.

 Possible SDA scope; multiple topics could be combined.

 Once SDAs are in place, a variety of end-use applications are possible, provided they meet appropriate boundary conditions.

NIA Schedule/Milestones

- **Phase 1 (Mar-Apr 2017)** provides summary white paper describing SDA process at high level in support of NRC strategy/roadmap documents
- **Phase 2 (proposed):** expands into more detail to provide additional guidance for use in LPP/REP
- **Phase 3 (proposed):** expands into ISG or other NRC guidance, including detailed discussion of boundary conditions and integration with the Licensing Technical Requirements Modernization Project

Phase 1 Report Topics

- Purpose/benefit of SDA
- Scope
- Criteria for selection of “Major Portions”
- Defining interfacing system boundary conditions
- Context within “staged licensing”
- Regulatory basis & precedent
- Practicality considerations
- Risks and mitigation
- Regulatory analogs

Next Steps

- Continued progress on clarifying “major portions” through NRC feedback and meetings, and Phase 2 and 3 activities
- Coordination and collaboration with NEI and others on developing guidance for a Regulatory Engagement Plan or Licensing Project Plan

Thank you