Options for Licensing New Reactors in the U.S. – Lessons Learned and Considerations for the Future

Donna Williams
Office of New Reactors
U.S. Nuclear Regulatory Commission
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Two-step Licensing Process

- **pre-construction**
  - Applicant submits safety analysis report
  - Safety evaluation report
  - Environmental impact statement
  - Construction permit review, hearing and decision

- **construction**
  - Applicant submits FSAR

- **operation**
  - Operating license

Licensing decisions finalized after construction
Construction times for the current U.S. Fleet
One-Step Licensing Process

- Licensing decisions finalized issuance

- Pre-Construction
  - Early Site Permit

- Optional Pre-Application Review
  - Standard Design Certification

- Combined License Review, Hearing, and Decision
  - Verification of Regulations with ITAAC
  - Reactor Operation Decision
Advantages of the One-Step Process

- Predictability
- Standardization
- Minimal changes during construction
- Reduced financial risk to applicants
Experience to date

- Operating licenses issued: 126
- Design Certifications issued: 5
- Combined Licenses issued: 4
Challenges of the One-Step Licensing Process

• Changes during construction are more difficult to implement
• First of a kind, innovative features delay review
• Challenging technical issues delay all combined license applications referencing a design
• Can delay start of construction
Lessons Learned and Process Improvements

• Two lessons learned reports issued (2013) of the one-step process: combined licensing process and post-licensing (construction)

• Findings. Regulatory reviews are enhanced by:
  – Improved design detail in applications
  – Early identification and resolution of complex technical issues
  – Minimizing design changes after submittal
  – Improved communication between regulator and utility
How do Advanced Designs fit into this model?

Non-Light Water Reactors

High Temperature Gas-Cooled Reactors (HTGRs)

Liquid Metal Reactors

Small Modular Reactors

B&W mPower

NuScale

Westinghouse SMR

Holtec SMR-160

4S

PRISM
Summary

The one-step process, when implemented as designed, would provide greater predictability and less risk.

Would a licensability/feasibility review better enable the eventual building of advanced reactor designs?