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Strategic Programmatic Overview of the New Reactors Business Line

January 24, 2019

Agenda

- Introduction – Margaret Doane
- Strategic Direction for the New Reactors Business Line – Fred Brown
- Large Light Water and Small Modular Reactor Licensing Activities – Rob Taylor
- Initiatives to Modernize Reviews – Anna Bradford

Agenda (continued)

- Vogtle 3 & 4 Construction Oversight – Bill Jones
- Advanced Reactor Readiness – John Monninger

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Strategic Direction for the New Reactors Business Line (NRBL)

Frederick Brown
Director
Office of New Reactors

Summary of NRBL strategic direction

- Complete work before us with an appropriate focus on "reasonable assurance of adequate protection"
- Be agile in responding to workload changes
- Develop enduring guidance and direction to facilitate both clarity and reliability for future applicants

Effectively Executing Our Current Workload

- "Whole Team" effort with our agency partner offices
- Reliable in our approach to licensing and inspection
- Efficient in the timeliness of our decisions
- Open in our communications and engagement

Scaling the Office of New Reactors for Current and Future Workload

- Combining internal work units
- "Pre-merging" work units with the Office of Nuclear Reactor Regulation
- Maintaining staff continuity and minimizing disruption where possible

Planning and Preparing for the Future

- Improving internal processes
- Preparing for the transition to operations at Vogtle
- Focusing guidance documents and pursuing approved rulemaking
- Executing the vision for advanced reactor licensing

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Large Light Water and Small Modular Reactor Licensing Activities

Robert M. Taylor
Director
Division of Licensing, Siting, and Environmental Analysis

Effective and Timely (1/4)

- Completed APR1400 DC Review on 42 month schedule
- Pursuing direct final rulemaking for certification

Photo of NRC and KHNP staffs during the signing of the APR1400 Standard Design Approval issued on September 28, 2018.

Effective and Timely (2/4)

- Completed 50 licensing actions supporting construction schedule
- Improved licensing efficiency
  - RAI enhancements
  - Clear review standards

Installation of Ring 3 on Vogtle Unit 3
Source: Southern Nuclear Company

Effective and Timely (3/4)

- Clinch River ESP
  - Leveraged audits
  - Reduced RAIs significantly
  - Completed SER with no open items
  - Assessed emergency planning zone size creatively

Photo of NRC staff examining core borings at Clinch River

Effective and Timely (4/4)

- NuScale SMR Design Certification
  - Phase 1 complete
  - Phase 2 progressing
  - Resolving challenging issues
  - Focus on safety and risk significance

New Reactors, Region II and Technical Training Center staff in NuScale Simulator
Source: NuScale Power

Preparing for Licensing Work in FY 2019 and Beyond

- Continuing licensing support of Vogtle construction
- No new light water reactor DC or ESP applications expected
- Completing current applications under review
- Preparing for new combined license application

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Initiatives to Modernize Reviews

Anna Bradford
Deputy Director
Division of Licensing, Siting, and Environmental Analysis

Improved Processes

- Improving the use of Requests for Additional Information (RAI)
  - Ensuring an RAI is necessary to reach a regulatory finding
  - Linking each RAI to the applicable requirement
  - Resulting in better use of resources

Improved Processes (cont'd)

- Refining the use of Audits
  - Applying lessons learned from a successful review
  - Keeping audits focused, short, and well documented
  - Benefiting staff and applicants

Transformation of Framework

- Initiated Part 50/52 Rulemaking
  - Ensuring consistency between the two regulations
  - Addressing lessons learned from the initial uses of Part 52 for certification, permitting, licensing, and construction
  - Goal to provide appropriate flexibility for applicants and licensees, and improved opportunity for staff to focus on safety

Transformation of Framework (cont'd)

- Refocusing of Standard Review Plan
  - Current content results in an in-depth review across all topic areas
  - Revise the SRP to focus on the regulatory requirement and necessary finding, not on historical information and prescriptive language
  - Provide a structure for staff reviews to be innovative and flexible, better tailored to specific applications

Original Approaches for Issues

- Departing from past practice while achieving desired safety and security outcomes
  - Tier 2* license amendment request for Vogtle
  - General Design Criterion 27 exemption for NuScale design certification
  - Demand to capacity ratio for structural analysis in APR-1400 design certification

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Vogtle 3&4 Construction Oversight

William Jones
Director
Division of Construction Oversight
Region II

Resources Aligned with Construction and Operational Inspection Challenges

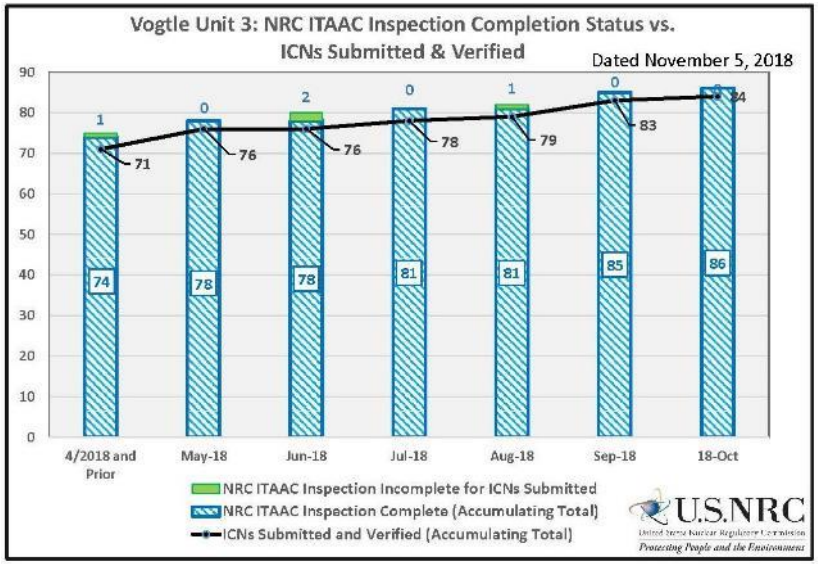
- Effectively implementing inspections through well qualified staff
- Previous organizational changes established foundation for transition to operations

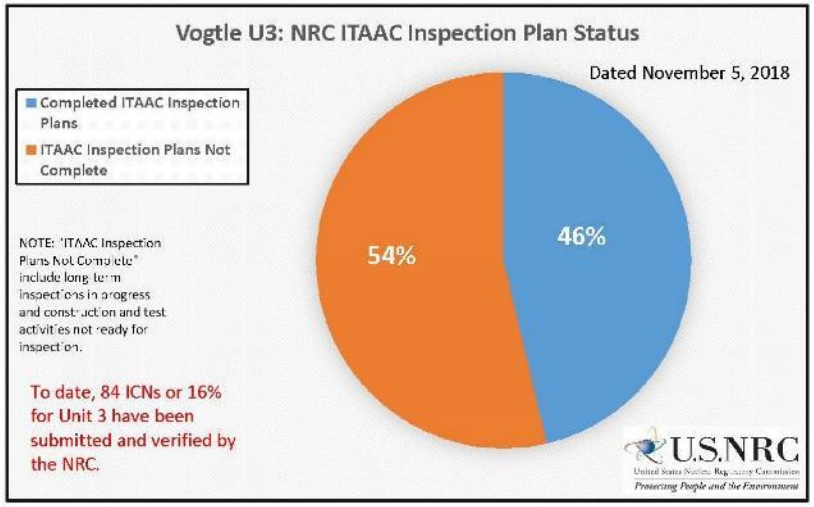
NRC inspector with French regulator

NRC inspector observing Unit 4 accumulator lift

Effectively Meeting the Construction and Operational Inspection Challenges

- Construction status
- ITAAC and operational programs inspection status
- Effectively executing inspections associated with ITAAC closures





* Unit 4 Metrics Similar to Unit 3

Innovative Project Oversight

- Vogtle Readiness Group
  - Effective oversight through cognizant offices throughout agency
  - Independence from organizational changes
  - Ensures integration of guidance and resources for the transition to operations
  - Provides agency and licensee continuity in licensing and oversight activities

Transformational Initiative

- Integrated Project Plan supports agency readiness
  - Informed by licensee milestones
  - Supports Vogtle Readiness Group decision making
  - Aligns agency staff on program activities through plant operations

Supportive Infrastructure

- Well established programs and processes
  - Maintains a forward inspection focus and ITAAC review
  - Independent of agency organizational changes in structure or leadership
- Joint NRO/NRR Office instruction developed for 10CFR52.103(g)

Leveraging International Experience

- Enhanced NRC staff transition to operations readiness
- Gained AP-1000 startup program experience
- Effective knowledge transfer

NRC Staff at top of the Sanmen Unit 2 steam generator

TTC AP1000 Simulator

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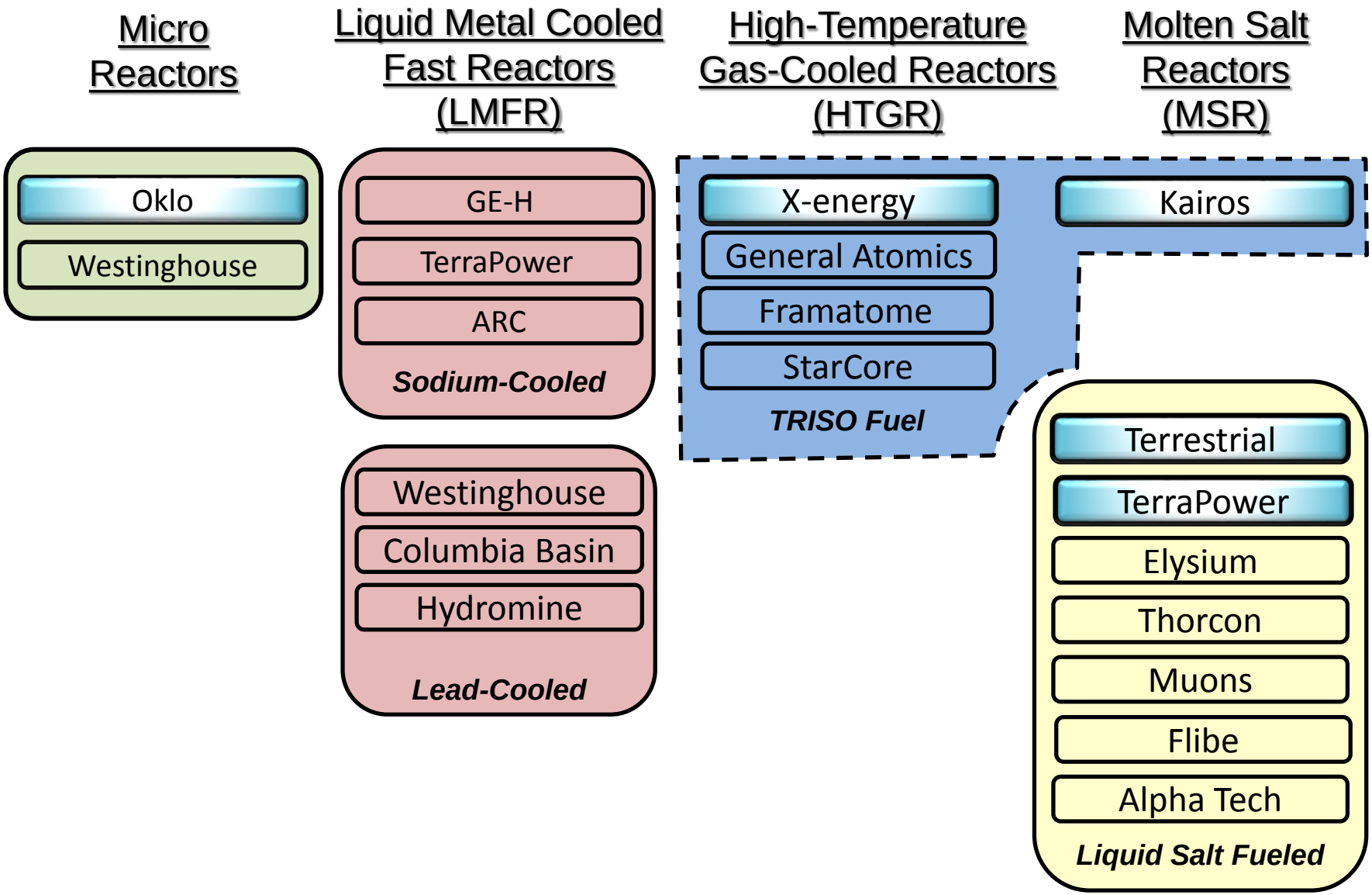
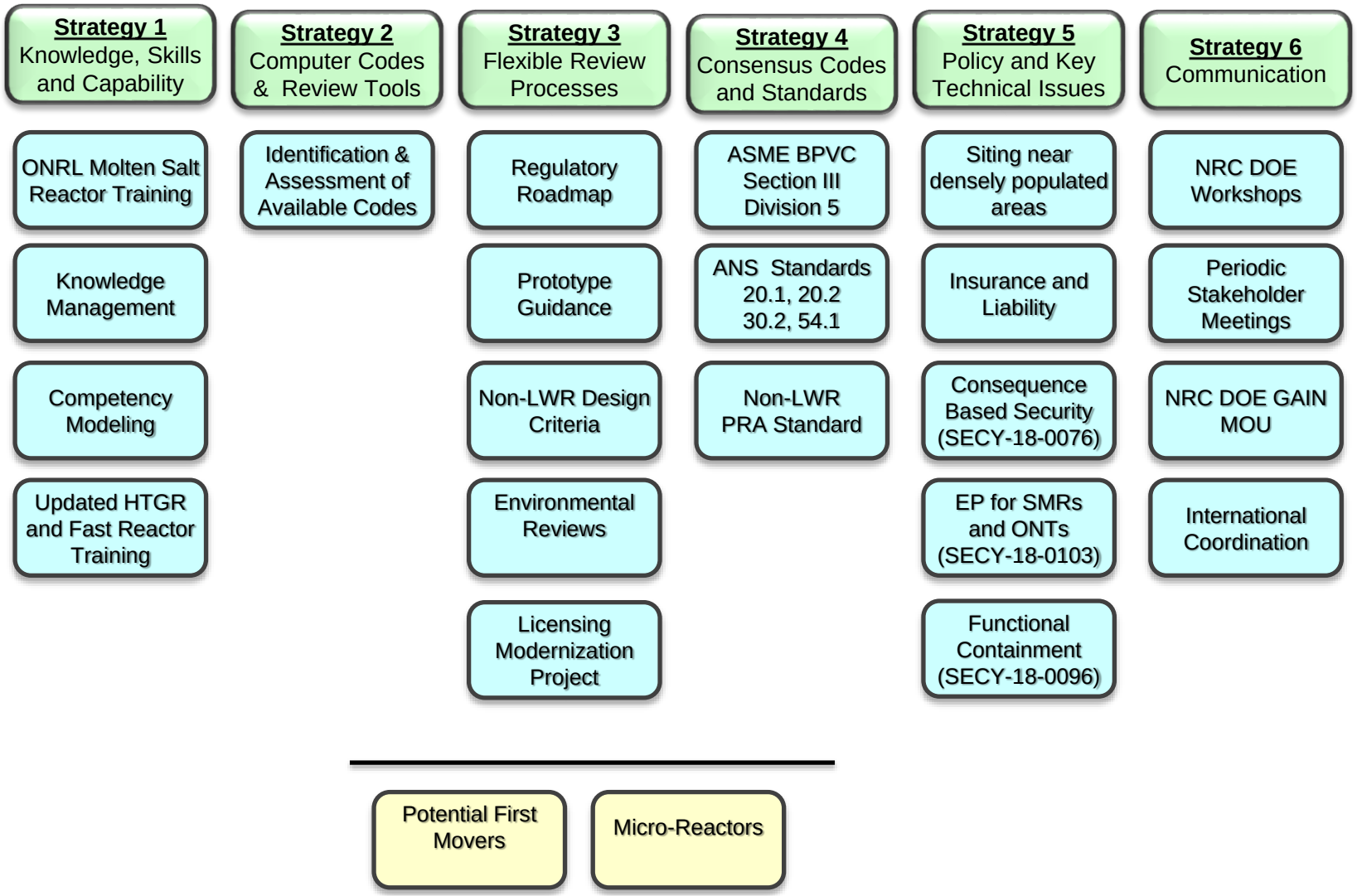
Advanced Reactor Readiness

John Monninger
Director
Division of Safety Systems, Risk Assessment, and Advanced Reactors

Broad Landscape



Working the Action Plan



Integrated Evaluation of the Licensing Framework

- Removing unnecessary barriers to incentivize holistic approach to safety
- Systematic use of risk assessment tools
- Balancing accident prevention and consequence mitigation
- Inter-relationship and linkage of initiatives being pursued

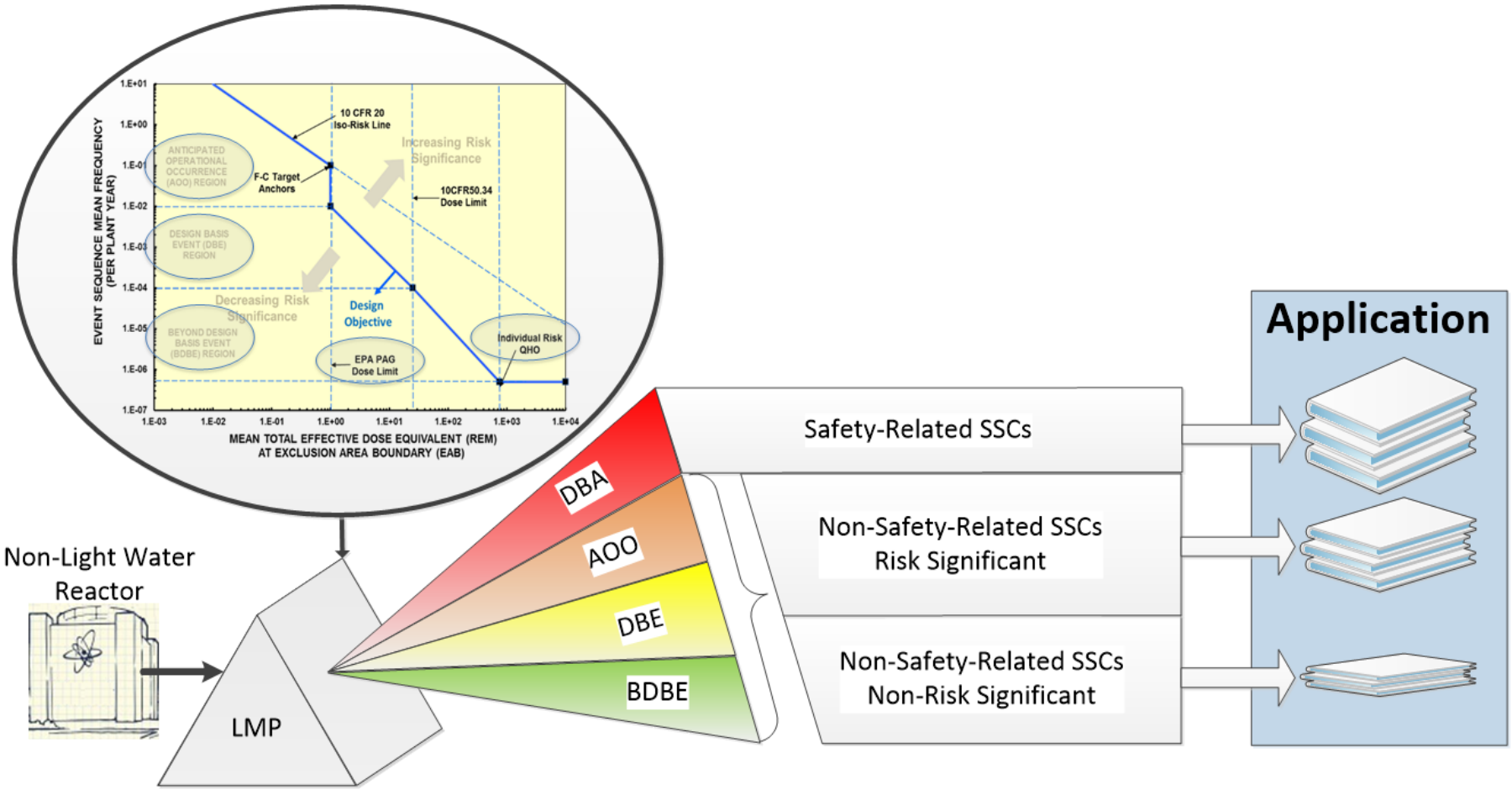
Developing a Risk-Informed and Performance-Based Framework

- Evaluating NEI 18-04, "Risk Informed Performance-Based Guidance for Non-Light Water Reactor Licensing Basis Development" for NRC endorsement
  - Systematic process
  - Identification of licensing-basis events
  - Classification of structures, systems, and components
  - Consideration of Defense-in-Depth

Developing a Risk-Informed and Performance-Based Framework (continued)

- Significant stakeholder interactions including coordination with Department of Energy and Department of Defense
- Engagement with the Advisory Committee on Reactor Safeguards and international community

Improving the Focus of the Content of Applications



Addressing Challenges

- Planning for the broad range of designs under development
- Expanding NRC staff organizational capacity
- Ensuring coherence of new licensing approaches

Acronyms

- DC – design certification
- ESP – early site permit
- FY – fiscal year
- IPP – Integrated Project Plan
- ITAAC – Inspections, tests, and acceptance criteria
- NEI – Nuclear Energy Institute
- RAI – request for additional information
- SER – safety evaluation report

Acronyms

- SMR – small modular reactor
- TVA – Tennessee Valley Authority