U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Advanced Reactor Stakeholder Public Meeting

June 18, 2020

Telephone Bridgeline: (888) 390-0788
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Time	Agenda	Speaker
10:00 - 10:10	Opening Remarks	NRC
10:10 - 10:15	Overview of Advanced Reactor Integrated Schedule of Activities	J. Segala, NRC
10:15 - 10:45	NRC Endorsement of the Advanced Non-LWR PRA standard	M. Gonzalez, M. Stutzke, NRC
10:45 – 11:10	Overview of NEI 20-09, "Performance of PRA Peer Reviews Using the ASME/ANS Advanced Non-LWR Standard"	V. Anderson, NEI
11:10 – 11:30	Promoting Preapplication Participation	B. Beasley, NRC
11:30 - 12:00	Discussion of Annual Fee Regulations for Non-LWRs	K. Austgen, NEI
12:00 – 12:15	Concluding Remarks and Future Meeting Planning	NRC/All

Advanced Reactor Integrated Schedule of Activities

Advanced Reactor - Summary of Integrated Schedule and Regulatory Activities

Summary of Integrated Schedule and Regulatory Activities (updated 06/10/2020)

Advanced Reactor Program - Summary of Integrated Schedule and Regulatory Activities*

Strategy 1	Knowledge, Skills, and Capability
Strategy 2	Computer Codes and Review Tools
Strategy 3	Flexible Review Processes
Strategy 4	Consensus Codes and Standards
Strategy 5	Policy and Key Technical Issues
Strategy 6	Communication

Legend

- Concurrence (Division/Interoffice)
- Federal Register Publication
- Public Comment Period
- Draft Issuance of Deliverable
- Final Issuance of Deliverable
- EDO Concurrence Period
- Commission Review Period
- ACRS SC/FC (Scheduled or Planned)
- External Stakeholder Interactions
- Public Meeting (Scheduled or Planned)

Version 6/10/20

Present Day

Strategy	Regulatory Activity	Commission Papers	Guidance	Rulemaking	NEIMA	Complete	2020 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2021 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Development of non-Light Water Reactor (LWR) Training for Advanced Reactors (Adv. Rxs) (NEIMA Section 103(a)(5))																													
	FAST Reactor Technology				x	x																								
	High Temperature Gas-cooled Reactor (HTGR) Technology				x	x																								
	Molten Salt Reactor (MSR) Technology				x	x																								
	Competency Modeling to ensure adequate workforce skillset					x																								
2	Identification and Assessment of Available Codes					x																								
	Development of Non-LWR Computer Models and Analytical Tools																													
	Code Assessment Reports Volumes 1 (Systems Analysis)					x																								
	Code Assessment Reports Volumes 2 (Fuel Perf. Anaylsis)					x																								
	Code Assessment Reports Volumes 3 (Source Term Analysis)					x																								
	Code Assessment Reports Volumes 4 (Fuel Cycle Analysis)														▼			▼												
	Code Assessment Reports Volumes 5 (Dose Analysis)																		▼		▼									
	Non-LWR MELCOR (Source Term) Demonstration Project																										▼	▼		
	Research on Innovative Methods to Enhance Seismic Safety for Design and Construction of Adv. Rxs														↓			▼												
	Develop Regulatory Roadmap for Adv. Rxs (NEIMA Section 103(a)(1))				x	x																								
	Develop prototype guidance for Adv. Rxs					x																								
	Develop non-LWR Design Crtieria for Adv. Rxs					x																								
	EPRI Topical Report on Tri-structural Isotropic (TRISO) Fuel		x								▼		▼																	
	Quality Assurance Program Plan for Sodium-cooled FAST Reactor Metallic Fuel Data Qualification					x																								
	Develop Fuel Qualification Guidance for Adv. Rxs		x		x										↓															
	Develop Advanced Reactor Content of Application Project (ARCAP) Regulatory Guidance		x					↓		↓		↓		↓		↓		↓		↓		↓	▼	↓		▼	▼			

https://www.nrc.gov/reactors/new-reactors/advanced.html

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NRC Endorsement on the Advanced Non-LWR PRA Standard

Michelle M. Gonzalez- RES/DRA

Marty Stutzke- NRR/DANU

Objectives

- Update on the advanced non-LWR PRA standard (ANLWR) review/endorsement
- Update on the NRC planned schedule for endorsement and schedule for future public engagement
- Endorsement of NEI's guidance on peer review
- Seek feedback from designers/applicants on the risk-informed applications that they plan to use

Status of Endorsement of ANLWR PRA Standard

- Staff has developed an endorsement plan, "Review and Endorsement of ASME/ANS Advanced NON-LWR PRA Standard Action Plan (ML20104C132)"
  - Task 1 - Supporting development of the standard
  - Task 2 - Preparation for review of the ANLWR PRA standard and NEI's peer review guidance
  - Task 3 - Staff review and endorsement
  - Task 4 - Development of schedule for staff review and endorsement*
  - Task 5 - Identification of resources*
  - Task 6 - Development of communication plan

  * These tasks have been completed

- Staff completed initial review and submitted ballot comments to the JCNRM on May 22nd

Status of Endorsement of ANLWR PRA Standard

- NRC is preparing to endorse the ANLWR PRA standard. Some of the ongoing activities include:
  - Comparing the ANLWR PRA standard to other PRA standards
  - Enhancing the staff guidance
  - Finalizing the scope of regulatory activities
- Staff will endorse the ANLWR PRA standard with the development of a new regulatory guide (RG), similar to RG 1.200
- Staff anticipates publishing the draft RG for public review and comment by Summer 2021 and the final RG by Fall 2022

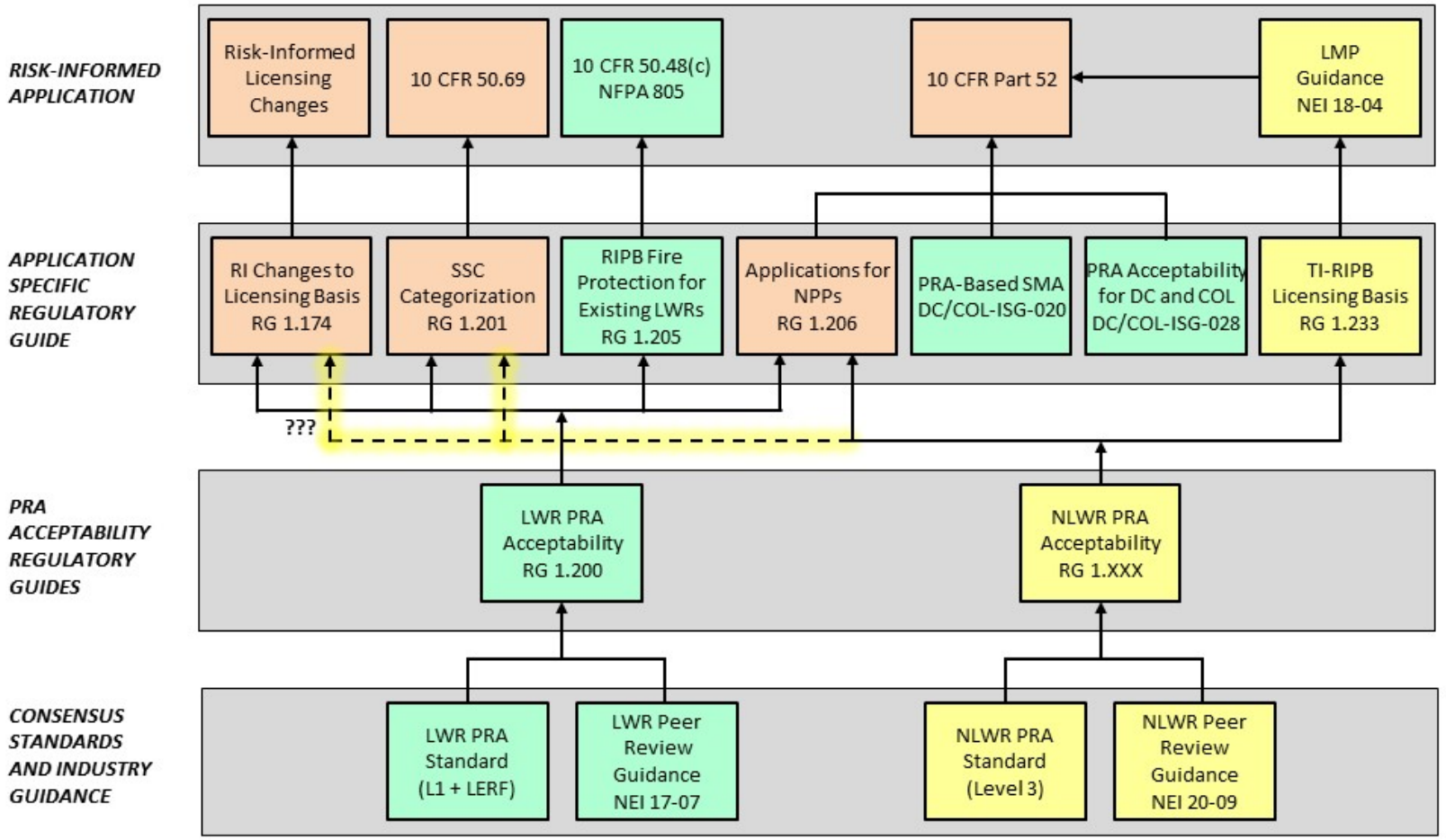
Schedule for Endorsement and Public Engagement

- Draft RG- September 2021
- Public review and comment- September through November 2021
- Final RG- November 2022
- Public meetings
  - First public meeting: July 2020 (tentative)
  - Approximately every 3-6 months thereafter

NEI's Guidance on Peer Review

- Received NEI 20-09, "Performance of PRA Peer Reviews Using the ASME/ANS Advanced Non-LWR Standard"
- Staff to review and endorse concurrently with the ANLWR PRA standard (2021)

Risk-Informed Applications



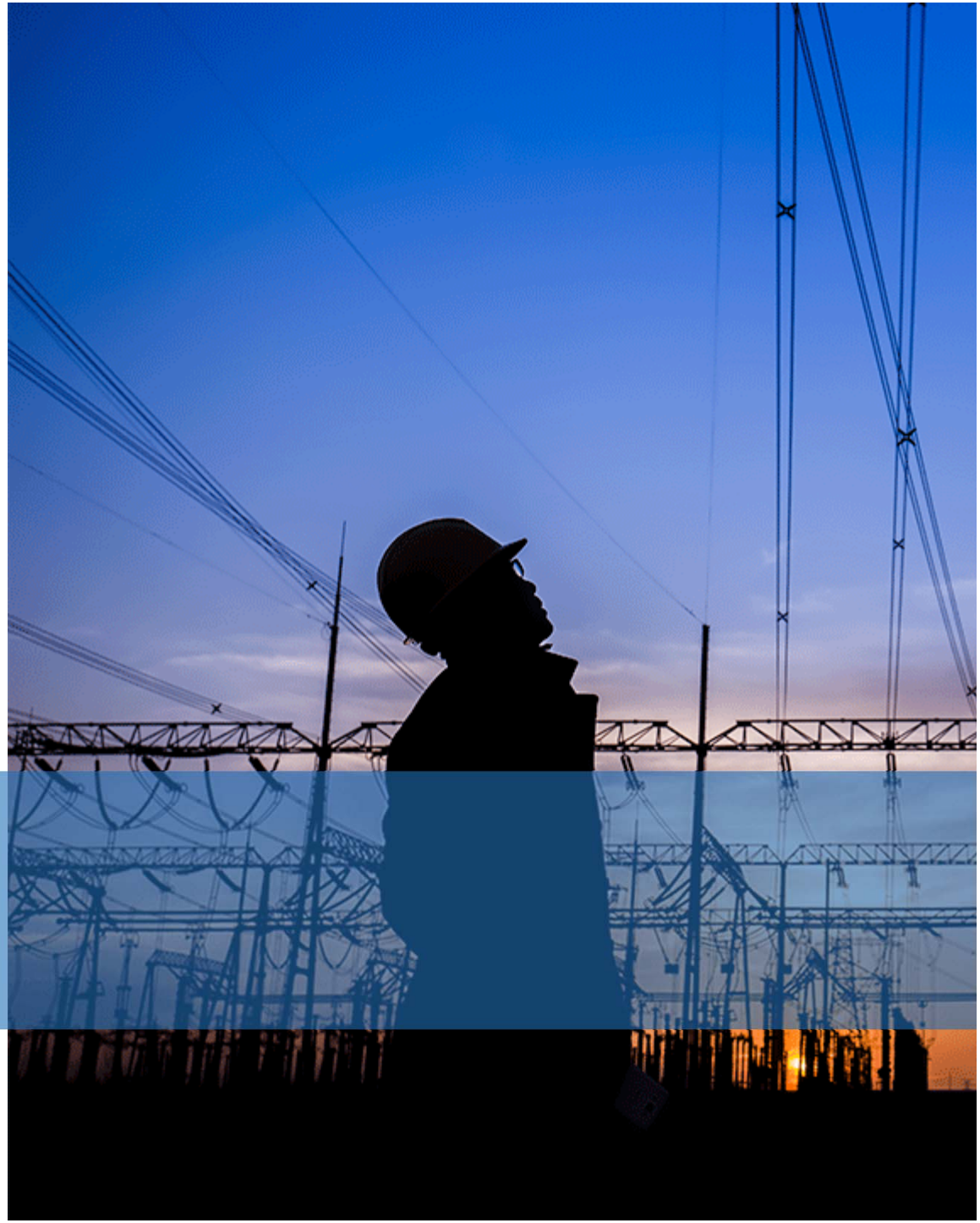
Acronyms

ANLWR- advanced non-light water reactor
ANS- American Nuclear Society
ASME-American Society of Mechanical Engineers
COL- combined license
DC- design certification
JCNRM- Joint Committee on Nuclear Risk Management
LMP- Licensing modernization project
LWR- light water reactor
NEI- Nuclear Energy Institute
NPP- nuclear power plant
RG- regulatory guide
RIPB- risk-informed performance-based
SSC- structure, system, and component

NEI 20-09: NLWR PRA Peer Review

Victoria Anderson, NEI

June 18, 2020



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NEI 20-09: NLWR PRA Peer Review Guidance

- Largely based on NEI 17-07 (LWR PRA Peer Review Guidance)
- Retained key aspects of LWR peer reviews
  - Review team
  - Consensus process
  - Assignment of findings for supporting requirements not met
  - Newly developed method process
  - Documentation of review in report

NEI 20-09: NLWR PRA Peer Review Guidance

- NLWR adjustments
  - Reflects differing standard structure
  - Changes to wording on qualifications to reflect novel designs
  - “On-site review” replaced with “final dedicated meetings” based on anticipated design reviews
- Path forward
  - Conduct of Kairos peer review using NEI 20-09 in the future
  - Future revision based on
    - Kairos pilot feedback
    - NRC feedback
    - Changes in final version of NLWR standard

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Reprise of
Promoting Preapplication Participation

Ben Beasley, Chief
Advanced Reactor Licensing Branch

Brief Background

- Pre-application interaction:
  - White paper, audit
  - Topical report, Preliminary Safety Information Document
- Value
  - Reliable regulatory findings early
  - More efficient permit or license review
  - More visibility for public on key topics

No SER

Write SER

Key Interactions – Topical Reports

- Principle design criteria
- Classification of SSCs
- Fuel qualification
- Source term development
- QA Program
- Safeguards Information Plan
- Accident analysis method

What and Why?

- Add definition
  - Specify key activities
- Promote use
  - Offer clear strategies
- Caveats
  - No substantive design changes
  - Timely RAI responses

Strategies

What would be meaningful?

Annual Fee Regulations for Non-Light Water Reactors

June 18, 2020

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Current Annual Fee Regulations

- Annual fees outlined in 10 CFR Part 171, governed by OBRA-90
  - Current variable annual fee structure established for light-water SMRs in June 2016
- Currently, annual fees not technology-inclusive and apply only to light-water reactors (LWRs)
  - Timely consideration given non-LWR application in front of NRC and more developers in pre-application discussions with the NRC

Goals to Consider in Fee Rule Change

- Urgent need for annual fee regulations for non-LWRs; important for investment decisions
- Meet OBRA-90 requirements
  - Regulatory costs shared equitably among large and smaller-scale reactor facilities, as well as among various technologies
  - Reasonable relationship to cost of regulatory services.
- Ensure continued protection of public health and safety

Preferred Annual Fee Rule Approach

Expand the SMR variable fee rule to include non-LWRs

- Basis for light-water SMR variable annual fee is equally applicable to non-LWRs
- Maximum, minimum, and variable fees are appropriate for large & SMR non-LWRs

Micro-reactors require further consideration

- Fees should be much lower than the variable fee rule minimum
- Fairness & equitability: fees have disproportionate impact on plant
- Cost of regulatory service expected to be very small

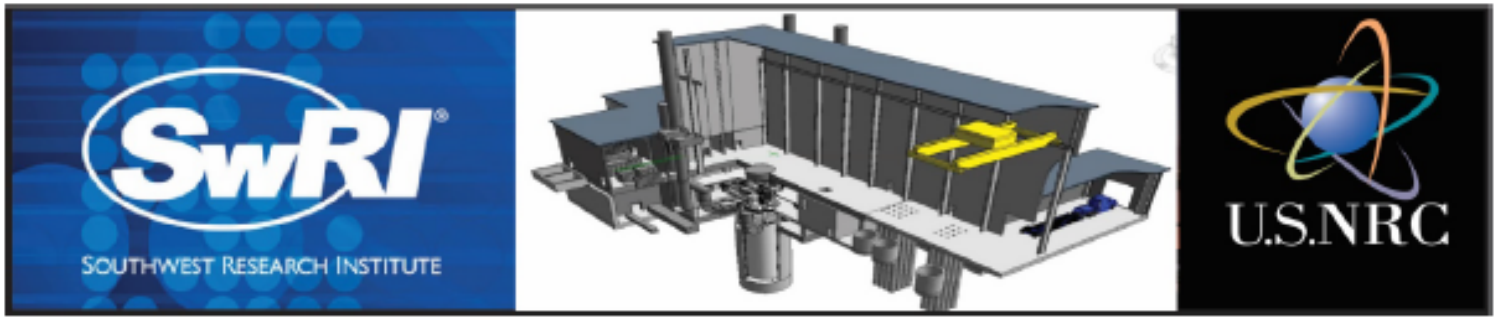
Longer term considerations

Future annual fee rulemakings based on operating experience of SMRs and non-LWRs

- Verify the expectations that advanced reactors require less regulatory service due to improved safety and simplicity
- Refine the SMR and non-LWR annual fees as detailed information becomes available through operating experience
- Consider whether risk-insights could be used in setting annual fees for SMRs and non-LWRs

Future Meeting Planning and Open Discussion

2020 Tentative Schedule for Periodic Stakeholder Meetings
August 6
September 24
November 5



Enhancing Risk-Informed and Performance Based Seismic Safety for Advanced Non-Light Water Reactors

Workshop: September 2-3, 2020, NRC Headquarters

Staff from the Nuclear Regulatory Commission (NRC) and NRC contractors will host a workshop on an enhanced technology-inclusive (TI) and risk-informed and performance based (RIPB) conceptual seismic design approach to achieve desired seismic safety for Advanced Non-Light-Water Reactors (ANLWR). The approach aligns with the Licensing Modernization Project (LMP) framework and may offer an alternative pathway for the design of future ANLWRs. At the workshop, NRC staff and contractors will present perspectives and detailed insights into a proposed seamless integration of seismic probabilistic risk assessment (SPRA) and the LMP framework into the design process; one that leverages the LMP safety criteria and categorization criteria for structures, systems, and components (SSCs) with the performance-based ASCE 43 seismic design criteria. The resulting design process is also integrated with defense-in-depth considerations to produce a risk-balanced seismic design with potential safety and cost benefits, as well as attributes consistent with existing 10 CFR Part 52 and Part 50 licensing processes. This TI-RIPB pathway for ANLWR to design against seismic hazards. Feedback from the ANLWR technical community and stakeholders at the workshop will be used by the NRC in planning future technical activities to further evaluate the feasibility and validity of the proposed TI-RIPB approach.

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