

Advanced Reactor Stakeholder Public Meeting

January 15, 2026

Bridge line: 301-576-2978

Conference ID: 516 771 56#



Time	Topic	Speaker
10:00 - 10:15 am	Opening Remarks	NRC
10:15 - 10:45 am	NRC staff engagement with developers planning to reference DOE and DOW authorizations	NRC
10:45 - 11:30 am	Nuclear Energy Maritime Organization (NEMO) Introduction	NEMO
11:30 - 12:00 pm	Pilot Program for an applicant prepared Environmental Document	NRC
12:00 - 1:00 pm	Lunch Break	
1:00 - 1:45 pm	Graded Seismic Site Characterization Approach	NEI
1:45 - 2:10 pm	Risk-Informed Technical Specifications	NEI
2:10 - 2:30 pm	Public Comment Period	Public
2:30 pm	Closing Remarks/Adjourn	

Opening Remarks



Advanced Reactor Program Highlights

Updates and Recent Accomplishments:

- September 17, 2025 – Public Meeting to discuss staff feedback on NEI’s White Paper “Selection of a Seismic Scenario for an EPZ Boundary Determination”.
 - December 1, 2025 – Approval of the final Safety Evaluation for TerraPower’s Kemmerer Unit 1, which represents a series of firsts for the NRC including the first ever approval of a commercial sodium-cooled fast reactor, the first approval of a functional-containment design, and our first non-light water reactor approved in the last 50 years. The Kemmerer Unit 1 review was completed in 18 months, 9 months ahead of schedule and 11% under budget.
 - December 9, 2025 – NRC staff issued a draft white paper describing preliminary staff views on high-level strategies and guidance for the oversight framework for microreactors during the operations phase to facilitate staff discussions with stakeholders on those topics.
 - December 11, 2025 – The Director of Office of Nuclear Reactor Regulation (NRR) issued a memo to provide expectations around NRC staff involvement with prospective applicants planning to utilize a prior Department of Energy (DOE) or Department of War (DOW) reactor facility authorization when pursuing NRC licensing of a same or similar design.
 - December 16, 2025 – NRC staff delivered SECY-25-103 “Update on Development of the U.S. Nuclear Regulatory Commission’s Advanced Reactor Construction Oversight Program,” which updates the Commission on NRC staff’s development of the Advanced Reactor Construction Oversight Program (ARCOP).
-

NRC Staff Engagement with
Developers Planning to Reference
DOE or DOW Authorizations
([ML25322A208](#))

Key Messages

- DOE and DOW are taking actions to authorize reactor pilot projects under their respective statutory authorities.
- NRC is taking action to enable leveraging information from DOE and DOW authorizations in future NRC licensing activities.
 - Participants in DOE/DOW authorization programs may choose to seek early engagement with the NRC to ensure they are positioned to appropriately leverage these authorizations.
 - Similar to other forms of pre-application engagement, expectation is that early interactions with the NRC will yield significant benefits, including increased efficiency and reduced review durations.

Background:

- EO 14300, “Ordering the Reform of the U.S. Nuclear Regulatory Commission,” section 5(d), requires the NRC to establish an expedited pathway to approve reactor designs that the DOE or the DOE have tested and have demonstrated the ability to function safely.
- EO 14301, “Reforming Nuclear Reactor Testing at the Department of Energy,” section 5, directs the DOE to start a new pilot program to expedite the testing of advanced reactor designs.
- EO 14299, “Deploying Advanced Nuclear Reactor Technologies for National Security,” directs the DOW to commence operation of an Army-regulated nuclear reactor at a domestic military installation

Purpose of Memo:

- Provide NRC staff with background information on the DOE authorization process and direction on expected stakeholder engagement.
- Clarify roles and responsibilities –
 - NRC is not party to the decision-making involved in the DOE authorization process.
 - NRC can observe selected portions of the process at the prospective applicants' election, with the intent of achieving greater efficiency in subsequent NRC licensing proceeding.

Expectations for NRC staff Observations

- Formalize NRC staff observation and align on an understanding of the expected outcome and any specific feedback requested.
 - NRC project managers should engage with prospective applicants to understand whether they intend to leverage DOE/DOW authorizations in future NRC licensing.
 - Regulatory engagement plan or standalone letter can communicate intentions.
- NRC PM should work with prospective applicants to identify points where NRC staff observation would yield the most benefit.

Summary

- Proactive engagement with prospective applicants supports establishing an expedited pathway to approve reactor designs that the DOW or the DOE have authorized and that have demonstrated the ability to function safely.
- NRC staff **OBSERVATION** of DOE or DOW authorization processes and the opportunity to gain technical insights on the associated designs are expected to yield tangible benefits for future NRC licensing of those designs.

References

- DOE Reactor Pilot Program:

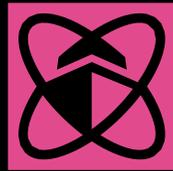
<https://www.energy.gov/articles/departments-energy-announces-initial-selections-new-reactor-pilot-program>

- DOW Janus Program:

https://www.army.mil/article/289074/army_announces_next_steps_on_janus_program_for_next_generation_nuclear_energy

- NEICA MOU:

[Addendum 9 to the MOU Between US NRC and DOE on Nuclear Energy Innovation\(ML25303A288\)](#)



NEMO

NUCLEAR ENERGY
MARITIME
ORGANIZATION

Nuclear Regulatory Commission
Advanced Reactor Stakeholders Meeting
January 15, 2026

Introducing NEMO



1. History

2. Why are we here?

3. Who is NEMO?

4. What is NEMO doing?

5. Role of Classification Societies

1. History of Maritime Nuclear

Maritime Nuclear History

- 70+ years of maritime nuclear
 - Nuclear Navies primarily
 - Nuclear Icebreakers
 - State-supported Floating Nuclear Power Plants (FNPPs)
- In those cases, National Governments have operated the assets



NS Savannah

- Initial nuclear-powered merchant ship, built as part of US President Eisenhower's "Atoms for Peace" initiative
- Launched in 1959 and delivered in 1962
- Served as a passenger liner from 1962-65, and as a cargo vessel until 1971, when she was deactivated
- Visited 32 domestic and 45 foreign ports, transited the Panama Canal, although excluded from several countries
- Currently owned by MARAD and located in Baltimore Harbor, USA



NEMO

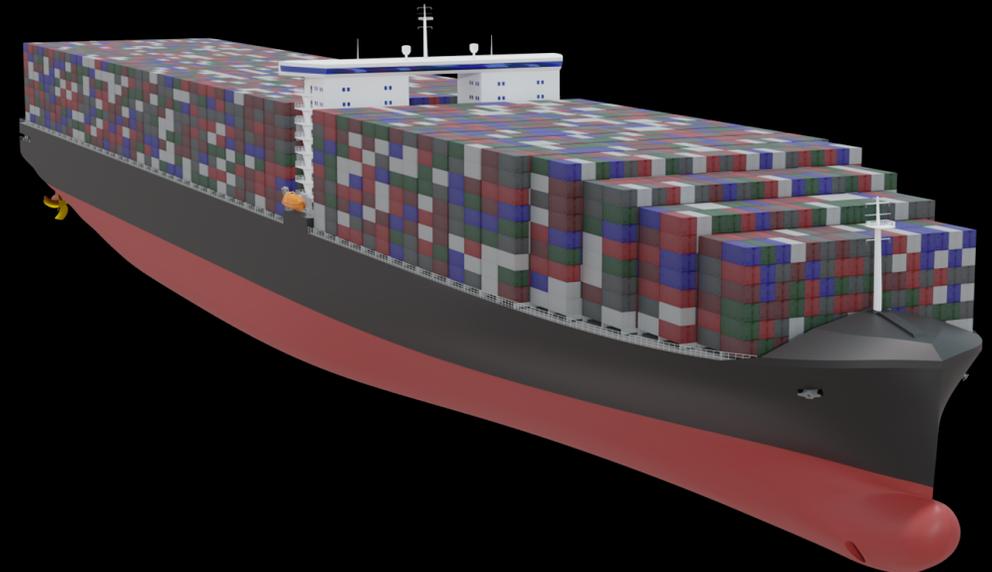
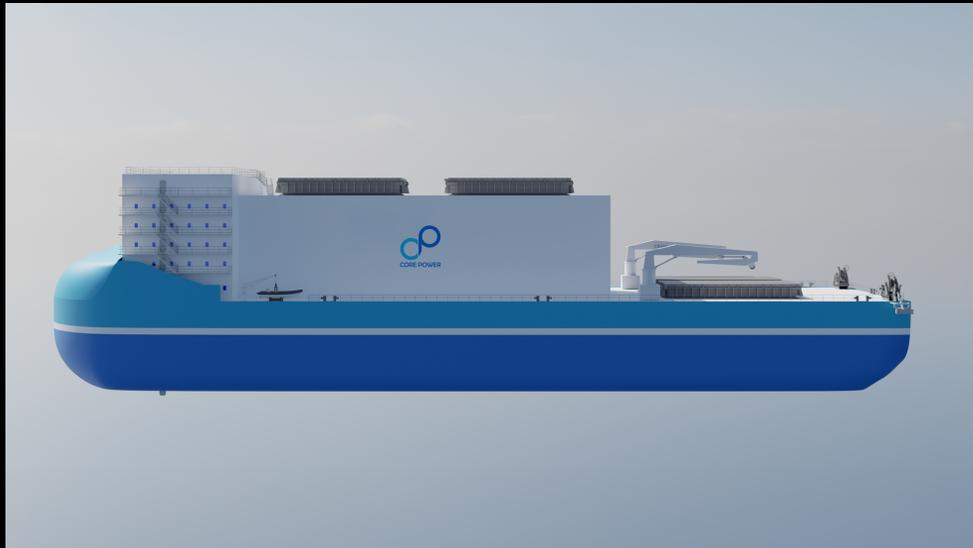
NUCLEAR ENERGY
MARITIME
ORGANIZATION



2. Why are we here?

Maritime Nuclear Coming Attractions

- FNPPs are coming soon
 - Power to the Grid and “Behind the Meter”
 - Data Centers
 - Alternative Fuel Production (E-Fuels)
 - Desalination
 - Natural Resources Extraction
 - Port Electrification
 - Other Uses
- Nuclear Propulsion for Commercial Ships is also coming



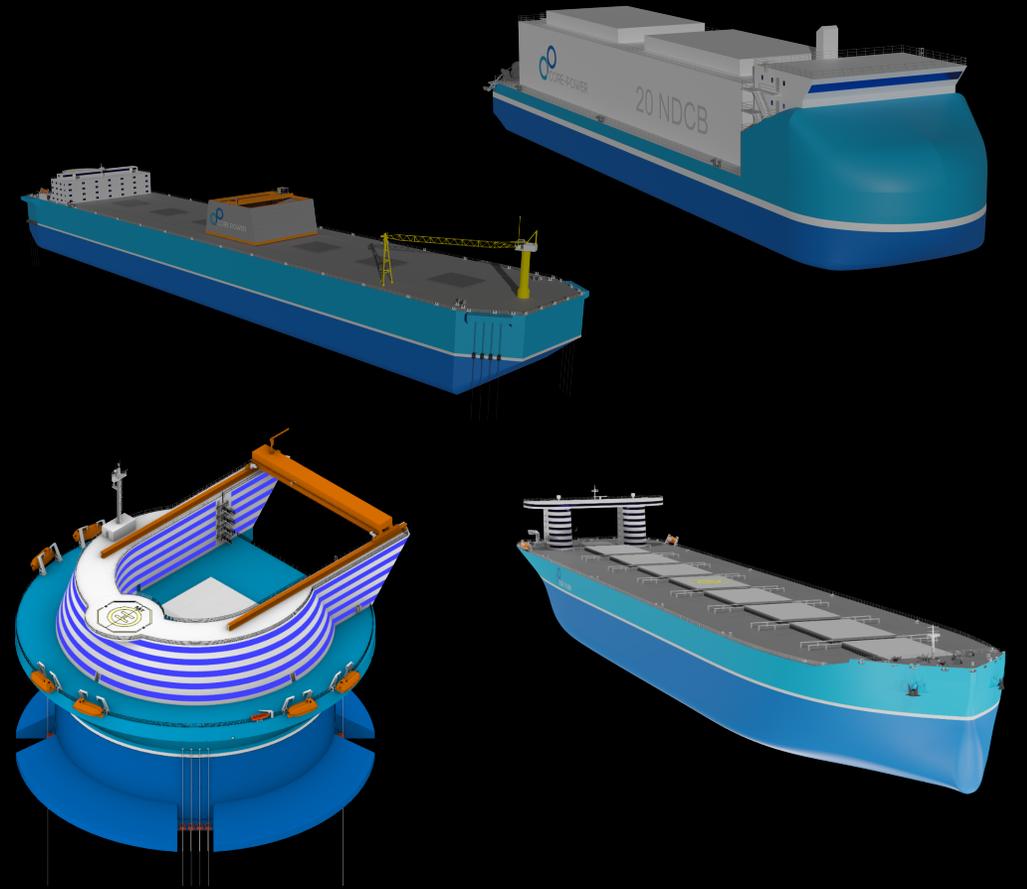
Floating Nuclear Environments

4 x main environments for floating nuclear power:

1. In ports and waterways, directly attached to shore-based infrastructure.
2. In nearshore environments, within the exclusive economic zones of countries.
3. Deep offshore or in international waters.
4. Nuclear powered ships.

Different combinations of rules and regulations will apply:

- Modular construction and repeatability.
- Type-approved containment for insurance.
- Central manufacturing, effective workforce.



Likely Maritime Operational Approaches



- Modular Construction in Different Locations
 - Bulk of the ship/barge/floating platform likely to be constructed in a traditional, non-nuclear shipyard
 - Nuclear reactor constructed in a dedicated nuclear facility
 - Potential for nuclear technology and platforms to be designed in different countries, and built in yet another country
- Nuclear Shipyard
 - Final Assembly, where ship/barge/floating platform and nuclear reactor are “fit-up”
 - Fueling and Commissioning likely, but not required, to occur here
 - Refueling and decommissioning also likely to occur here
- Used Fuel Storage
 - Potential for used fuel storage on the barge/floating platform or support ship
 - Long-term storage at Nuclear Shipyard possible, although that will depend on operating model

3. Who is NEMO?

NEMO Membership Summary

-  1 Nuclear tech developers and vendors / project managers
-  2 Shipowners/operators
-  3 Shipyards
-  4 Port Authorities
-  5 Class Societies
-  6 Insurance
-  7 Maritime & Energy Law
-  8 Power off-takers / end-users



AMAZUL



4. What is NEMO doing?

NEMO's Mission



NEMO

NUCLEAR ENERGY
MARITIME
ORGANIZATION



Represent interests of members in an Int'l maritime nuclear community



Focus on regulatory and standards development at IGOs



Engagement with Government Departments at National Level



Advance the safe, secure and sustainable integration of nuclear technology into maritime



Work as a recognized NGO at IMO and IAEA.



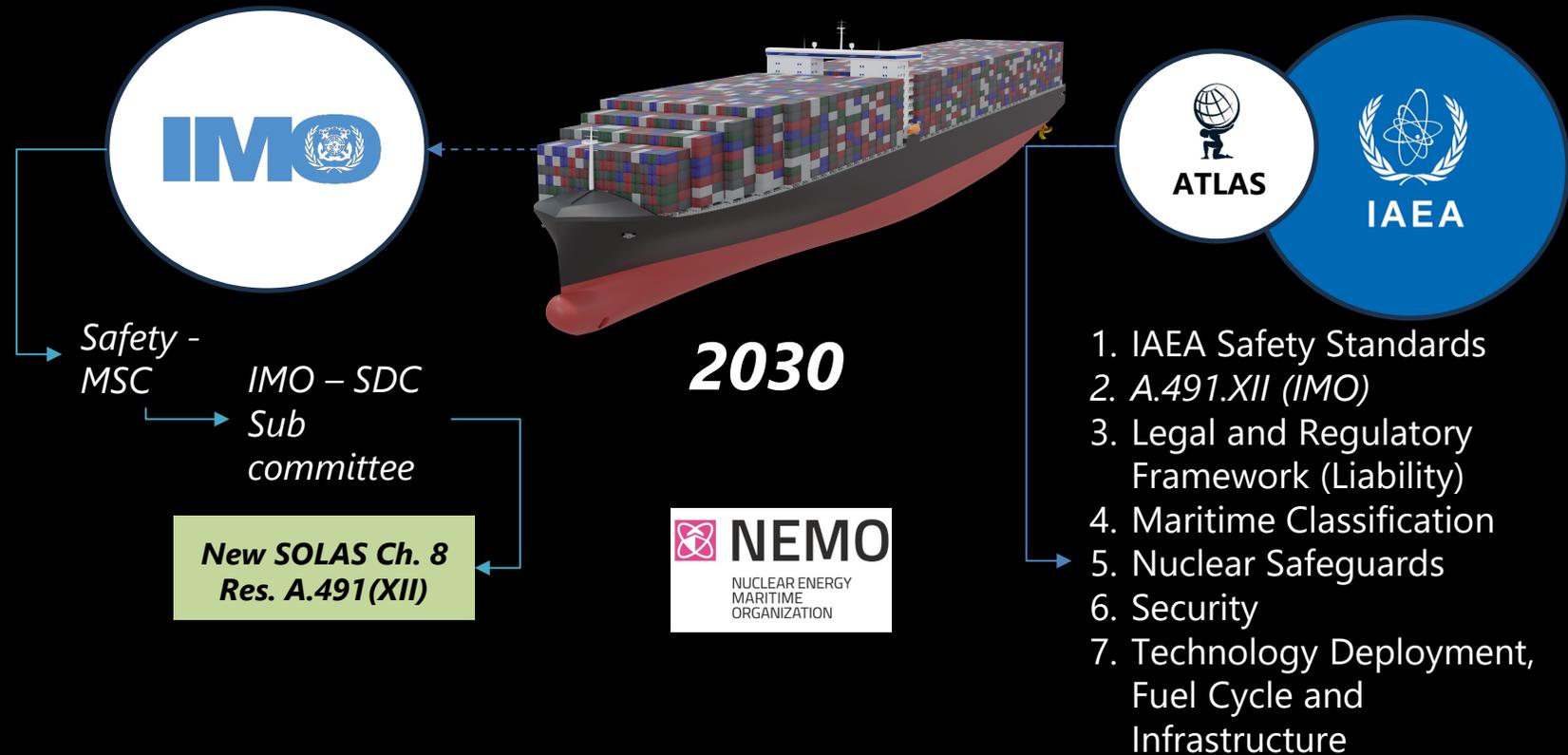
Help create future-oriented standards and rules for deployment of floating nuclear

NEMO's First 21 Months



- 56 International Members
- NGO status at IAEA and IMO
- Representation at the 69th IAEA General Conference, International Forums and Working Groups
- Presentations in international conferences and webinars
- Workshops – Safeguards by Design and Security by Design – with more to come in 2026
- Prominent role on upcoming IAEA Atomic Technology Licensed for Applications at Sea (ATLAS) Initiative
- Formation of 3 active Working Groups with 11 Task Forces, including:
 - Maritime Regulatory mapping exercise undertaken
 - Revision for the update of the Safety Considerations in the Use of Ports by Nuclear Merchant Ships (1968)
 - Gap analysis of Nuclear Liability conventions and agreements, with the proposal development of new ones

International S, S & S standards for nuclear in maritime

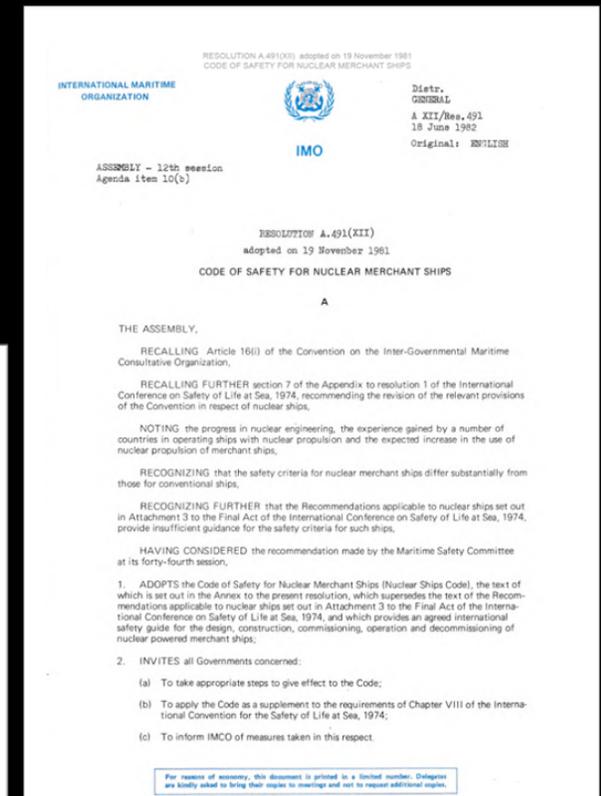
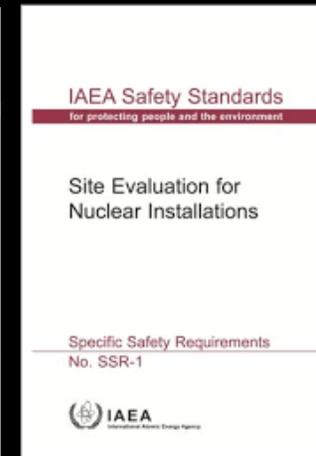
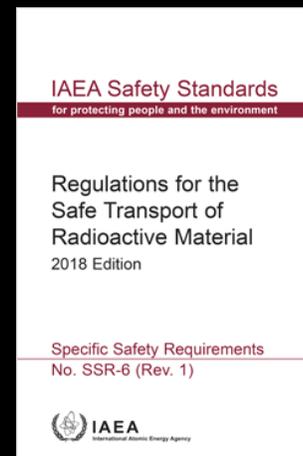


Creating the conditions for civil nuclear ships



Some of the Issues to Overcome

- Outdated Maritime Regulations for Nuclear Power Plants and Propulsion, where any exist
- Nuclear Regulations written for Fixed Terrestrial Facilities, focusing on lifecycle phases:
 - Siting
 - Design
 - Manufacturing and Construction
 - Commissioning
 - Shipping/Transport
 - Operations
 - Fueling and Refueling
 - Maintenance
 - Decommissioning



1 Maritime Regulations ("Nautilus" WG)

Looking at the application of Nuclear technology within Maritime, in particular, regulatory development at IMO and supporting Code of Safety for Nuclear Merchant Ships update.

2 Nuclear Safety, Security & Safeguards ("Savannah" WG)

Looking at the challenges and opportunities of maritime deployment from the perspective of Nuclear regulatory bodies. Supporting progress of FNPP and civil nuclear propulsion developments through IAEA.

3 Maritime Nuclear Liability ("Annorax" WG)

Looking at the concept of commercial 'insurability' and the development of a suitable liability convention for floating nuclear, in the context of the 1962 Brussels Convention.

Future WG potential development:

WG4 = Seafarer Training Regimes

WG5 = Ports and Interfaces

Working Group #1 “Nautilus” Activities



- Supporting update to IMO Code of Safety for Nuclear Merchant Ships
 - Detailed discussion to follow
- Four Task Forces
 1. FNPP Focus Group – develop definitions applicable to FNPPs
 2. INF Code Study – recommend what parts of INF Code should apply to nuclear propulsion
 3. Training and Certification – review of IMO STCW Code for maritime nuclear potential changes
 4. Regulatory Scenarios – regulatory mapping exercise for specific scenarios

Working Group #2 “Savannah” Activities



- Supporting update to IMO Code of Safety for Nuclear Merchant Ships
- Support to IAEA ATLAS Initiative when commenced
- Workshops for members with IAEA, IMO, national regulators, and industry
 - Safeguards by Design in March 2025
 - Security by Design in October 2025
 - Nuclear Safety in April 2026
- Three Task Forces
 1. Security Mapping – analyze security requirement differences for maritime vs. terrestrial facilities
 2. Update to 1968 IAEA/IMO *Safety Considerations in the Use of Ports and Approaches by Nuclear Merchant Ships*
 3. Assessment of recommended changes to IAEA Safety Analysis Report guidance for nuclear ships at sea

Working Group #3 “Annorax” Activities



- Focused on developing internationally harmonized rules and guidance for nuclear liability in maritime operations, bridging gaps between existing conventions and emerging technologies.
- Four Focus Areas/Sub-Groups
 1. Align International Conventions: Integrate principles from the Paris and Vienna Conventions on nuclear liability with maritime law under the IMO framework.
 2. Define Operator Responsibility: Establish clear liability limits and insurance requirements for shipowners, operators, and technology providers.
 3. Support Regulatory Development: Provide input to IMO and IAEA initiatives, including the ATLAS program, to ensure liability frameworks evolve alongside technical standards.
 4. Facilitate Industry Adoption: Create practical guidance for classification societies, insurers, and governments to enable safe and commercially viable deployment of nuclear-powered vessels and FNPPs.



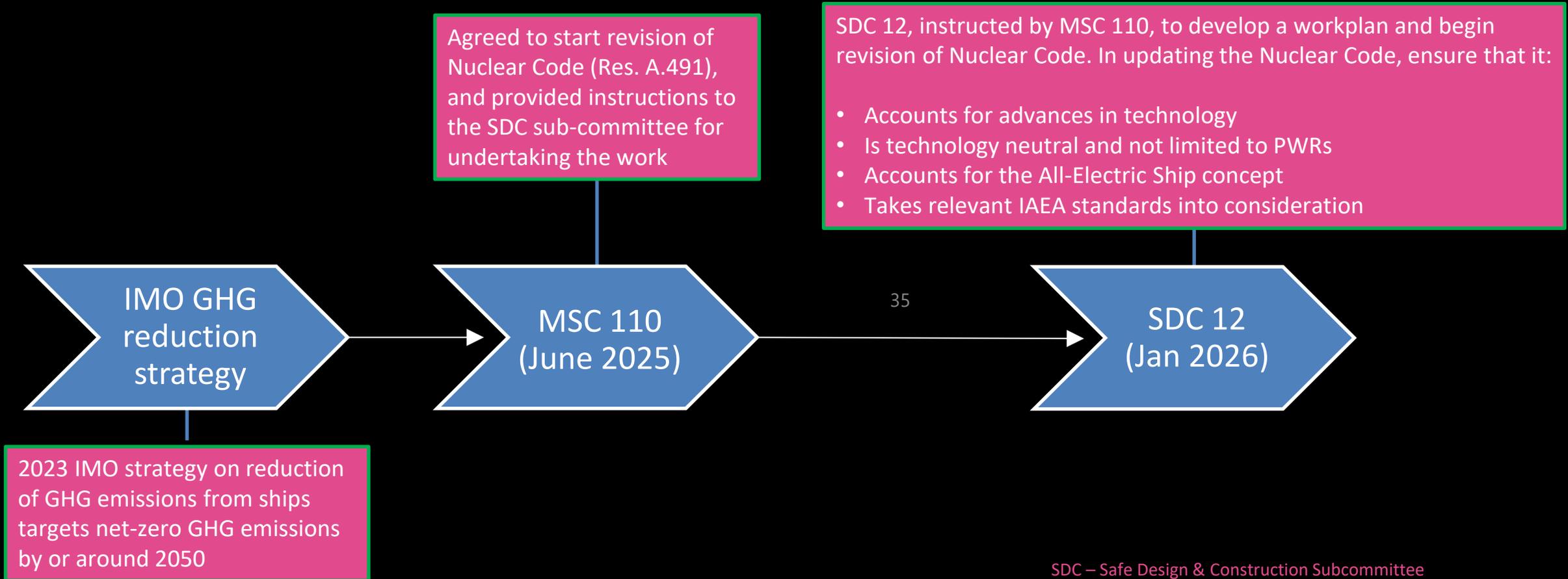
NEMO

NUCLEAR ENERGY
MARITIME
ORGANIZATION

NAUTILUS Project Team
Role of Classification Societies

Meg Dowling, Lloyd's Register
NEMO WG1 'Nautilus' Chair

International Maritime Regulatory Developments



SDC – Safe Design & Construction Subcommittee
MSC – Maritime Safety Committee
IMO – International Maritime Organization
GHG – Greenhouse gas

Objectives

- Organize NEMO's position related to proposals at SDC12
- Prepare and submit proposals and information to IMO SDC12 for the update of the Nuclear Code
- Attend SDC12 with NEMO to support update of the Nuclear Code
- Report on key takeaways from SDC12
- Align NEMO's participation with IAEA ATLAS

NEMO Position

- Aligns with US Submission to form Working Group
- Will support an intersessional correspondence group
- For topics outside of the IMO's remit, NEMO will continue to support:
 - Liability and Insurance
 - Security
 - Safeguards

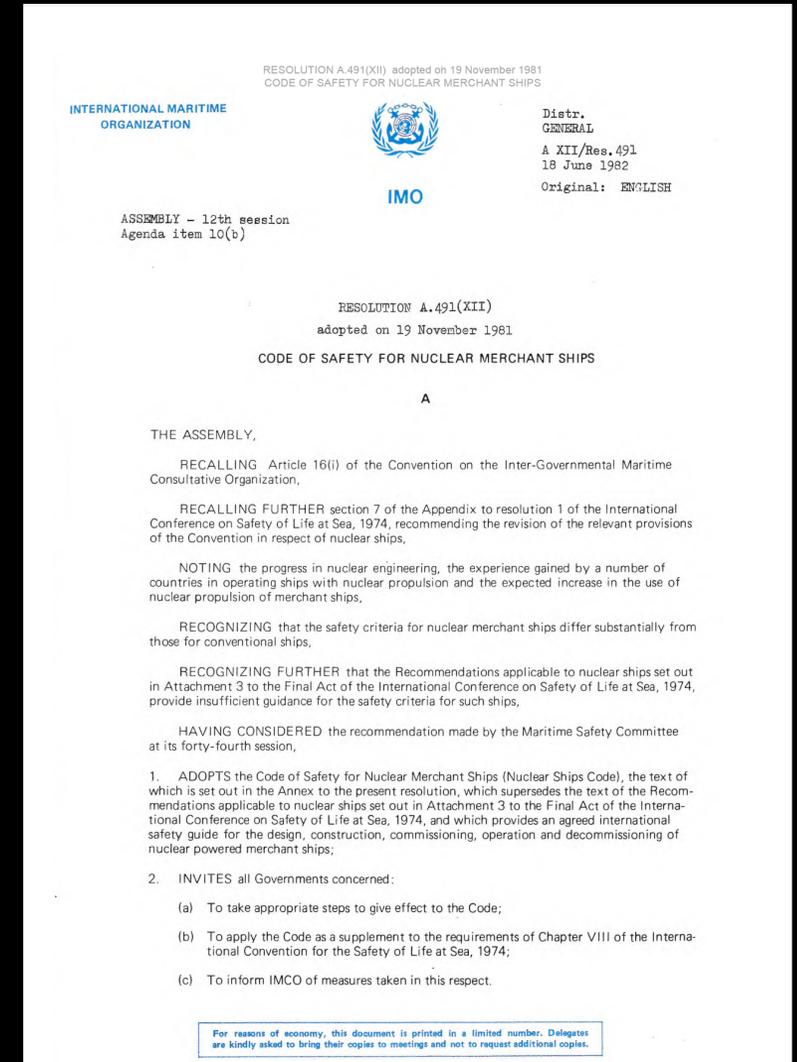
The Code of Safety for Nuclear Merchant Ships Assembly Resolution A.491



NEMO

NUCLEAR ENERGY
MARITIME
ORGANIZATION

- Supplement to SOLAS Chapter VIII, adopted in 1981
- Prescribes requirements for ships using early designs of PWRs and a direct steam cycle propulsion system
- Represented a barrier to positive technology developments
- Needs revision to align with updated IAEA standards



Introduction to Classification Societies

History of Classification

Class originated at Lloyd's coffee house in London, 1760, where merchants and shipowners discussed trade.

Subscriptions for the Society's annual Register Book, begun in 1764, funded surveyors to list, rate and class the condition of vessels.

Lloyd's hired experts to inspect and classify vessels calling into London.

Over time, this practice documented ship quality and informed the market interests related to ship safety, merchant insurance and investments.



Edward Lloyd's Coffee House



A sketch of a 18th century Lloyd's Register surveyor as imagined by Harry Cornish (1839-1928)

Classification Today



Standards for ship safety

- Develop, publish and implement rules for quality, safety and reliability of ships
- Owners and operators look to classification societies to survey and verify the asset's compliance with Classification Rules and national (Statutory) Regulations



International alignment

- Safety and operational efficiency are essential for the global shipping and offshore industries
- Internationally recognized classification ensures ships are built to uniform standards, can operate effectively and safely, comply with maritime and environmental regulations



Marine focus

- Typical maritime safety includes:
- structural strength and hull integrity
 - safety and reliability of the main propulsion and steering systems
 - environmental impact of operations
 - fire protection and lifesaving equipment

Most Classification Societies are accredited as Recognized Organizations (ROs), which allows Class to perform delegated services on behalf of maritime authorities, including surveys and inspection activities.

Contact

Nuclear Energy Maritime Organization Ltd.

Building 5, Chiswick Business Park London W4 5YF, United Kingdom

Email: secretariat@nemo.ngo

Tel: +44 20 4542 8804

Virginia Crosbie, Managing Director
Dr Mamdouh el Shanawany, Chairman

www.nemo.ngo

www.linkedin.com/company/nemo-nuclear-energy-in-maritime-organisation/

NRC Maritime Nuclear Efforts

- Organized a cross-office team of experts focused on maritime nuclear
- Coordinating efforts across the U.S. Government
 - Participating in the Department of Energy’s Maritime Nuclear Applications Group (MNAG)
 - Developing memoranda of understanding with the Bureau of Ocean Energy Management (BOEM) and the U.S. Coast Guard (USCG)
- Engaging internationally
 - Participating in the International Atomic Energy Agency’s ATLAS (Atomic Technologies Licensed for Applications at Sea) project
 - Supporting the USCG at the International Maritime Organization
- Building on work underway for transportable microreactors as well as historical experience*
- Early engagement with the NRC is essential for interested stakeholders

Contact: Alec.Neller@nrc.gov

*Available Offshore Power Systems licensing documents: [ML20119A462](#), [ML24152A289](#), [ML19242D918](#), [ML19242D919](#), [ML19284A856](#), [ML20031C715](#), [ML20070J215](#)

Streamlining NEPA Reviews for New Reactors



Applicant-Prepared Draft Environmental Documents

January 15, 2026

Agenda

- Legislative Drivers
- Applicant-Prepared Environmental Documents
- Process and Guidance Development
- Expected Benefits
- NRC's Pilot Project

Legislative Drivers ... The FRA and ADVANCE Act

Fiscal Responsibility Act (FRA):

- Signed into law on June 3, 2023.
- Mandatory deadlines and page limits for EAs and EISs.
- Defined roles of lead, participating, and cooperating agencies.

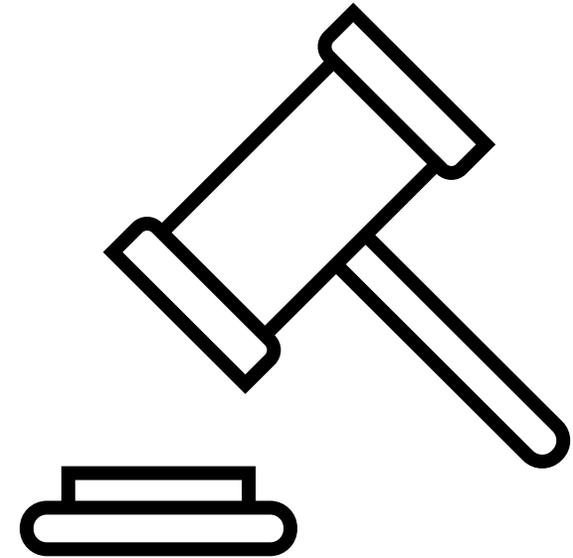
Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024 (ADVANCE Act):

- Signed into law in July 2024.
- Submit report to Congress (January 2025) on efforts to facilitate efficient, timely, and predictable environmental reviews of applications.
- Assess licensing review process for new nuclear facilities at former fossil-fuel power and brownfield sites.
- Develop strategies and guidance for microreactors.

Together, these acts empower NRC to streamline NEPA reviews, reduce timelines, and support advanced nuclear deployment.

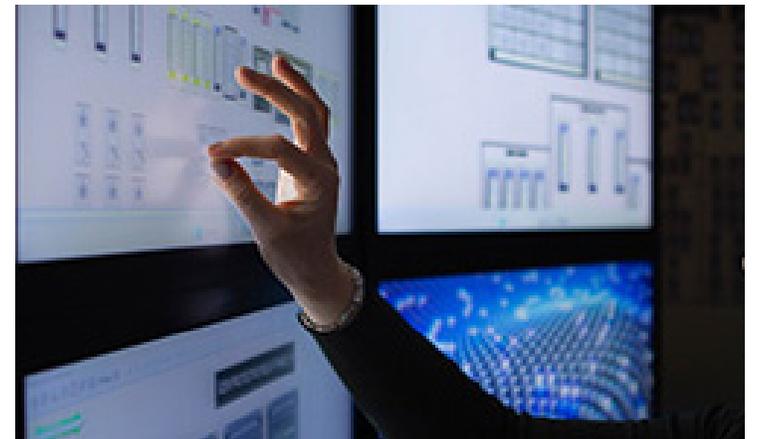
FRA and ADVANCE Act: Enabling Applicant-Prepared NEPA Documents

- Fiscal Responsibility Act- encourages NRC to allow applicants to prepare Draft NEPA documents with agency oversight and responsibility.
 - ✓ 42 CFR 4336a(f) (FRA Amended NEPA regs)- Approve applicant developed NEPA docs under agency supervision. Agency to establish procedure, provide guidance throughout and retain independent evaluation and legal responsibility.
 - ✓ SRM-24-0046 (7/28/25)- Approves NRC oversight of applicant developed draft NEPA doc and directs development of standardized guidance to ensure consistency, efficiency and reduce overlap.
- ADVANCE Act 506(J)- requires NRC to report on authorizing the use of an applicant's environmental impact statement as the Commission's draft environmental impact statement, consistent with section 107(f) of the National Environmental Policy Act of 1969 (42 U.S.C. 4336a(f)).



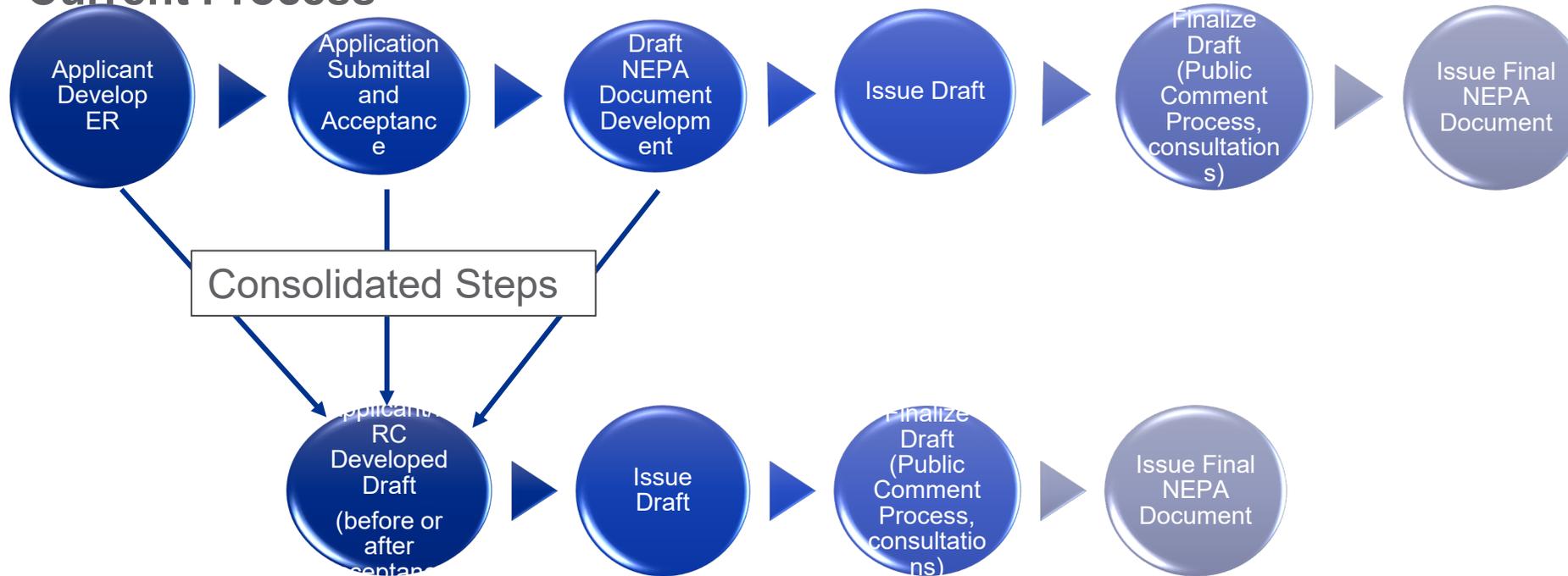
Status

- **Revisions to NRC's NEPA Implementing Regulations (10 CFR Part 51):** Among other changes, adds process for applicant-prepared draft environmental documents,.
- **Process and Guidance Development:** Staff established the applicant-prepared draft environmental document process and guidance by benchmarking practices from other Federal agencies, including DOE, DoD, and FERC.
- **Applicant-Prepared Draft EIS – Pilot:** A pilot initiative is underway to implement and evaluate the applicant-prepared draft Environmental Impact Statement (EIS) process.



Process and Expected Benefits

Current Process

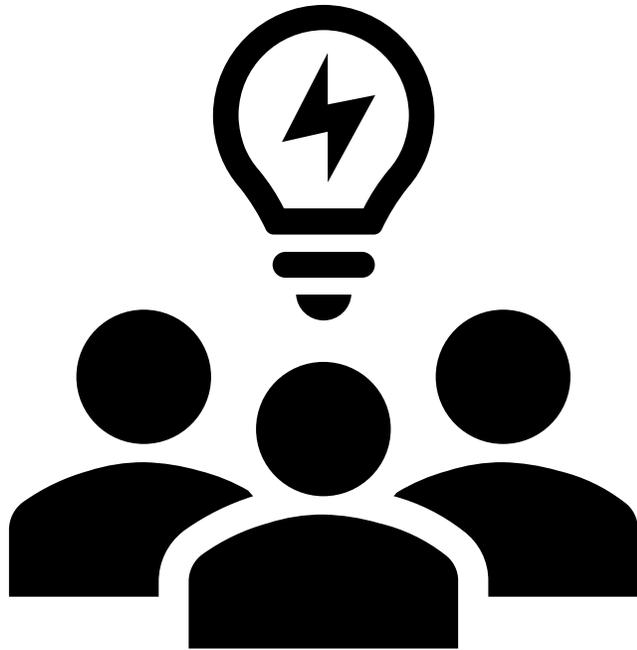


Expected Benefits:

- ✓ **Efficiency:** Reduces duplication of efforts. (One NEPA document instead of two).
- ✓ **Resource Savings:** NRC focuses on oversight rather than document preparation.
- ✓ **Time Savings:** Fewer steps/faster reviews.

Proposed Process

NRC Pilot Program for Applicant-Prepared NEPA Documents



Purpose:

- Advancing the review of new reactor license applications and piloting of applicant-prepared Environmental Impact Statements (EIS) under the National Environmental Policy Act (NEPA).

Pilot Program Objectives:

- Promote innovation and transparency in environmental stewardship.
- Ensure a timely, efficient, and compliant environmental review process.
- Strengthen collaboration between NRC, applicants, and applicant-hired contractors.

Responsibilities Outlined

NRC:

Regulatory Compliance: NEPA, ESA, NHPA, and related statutes.

Level of NEPA Review: Determine level of NEPA Review

Guidance & Oversight: Work with applicant to define project purpose and need and develop reasonable range of alternatives; provide technical direction and oversight.

Schedule Management: Establish and monitor timelines per NEPA FRA.

Focused Analysis: Prioritize areas with potential significant environmental impacts.

Consultation: Engage Tribal, Federal, State, and local entities early and effectively.

Document Integrity: Independently review, validate, and approve NEPA documents.

Responsibilities Outlined

Applicant & Contractor:

Qualified Resources: Employ experienced contractors; disclose conflicts of interest.

Information Sharing: Provide timely, accurate scientific and technical data.

Transparency: Identify document preparers and their qualifications.

Responsiveness: Replace contractors or adjust approach if NRC deems document insufficient.

Administrative Record: Maintain and deliver complete documentation upon request, with sensitive data clearly marked.

Thank you

Lunch Break

Meeting will resume at 1:00 PM ET

January 15, 2026

Bridge line: 301-576-2978

Conference ID: 516 771 56#

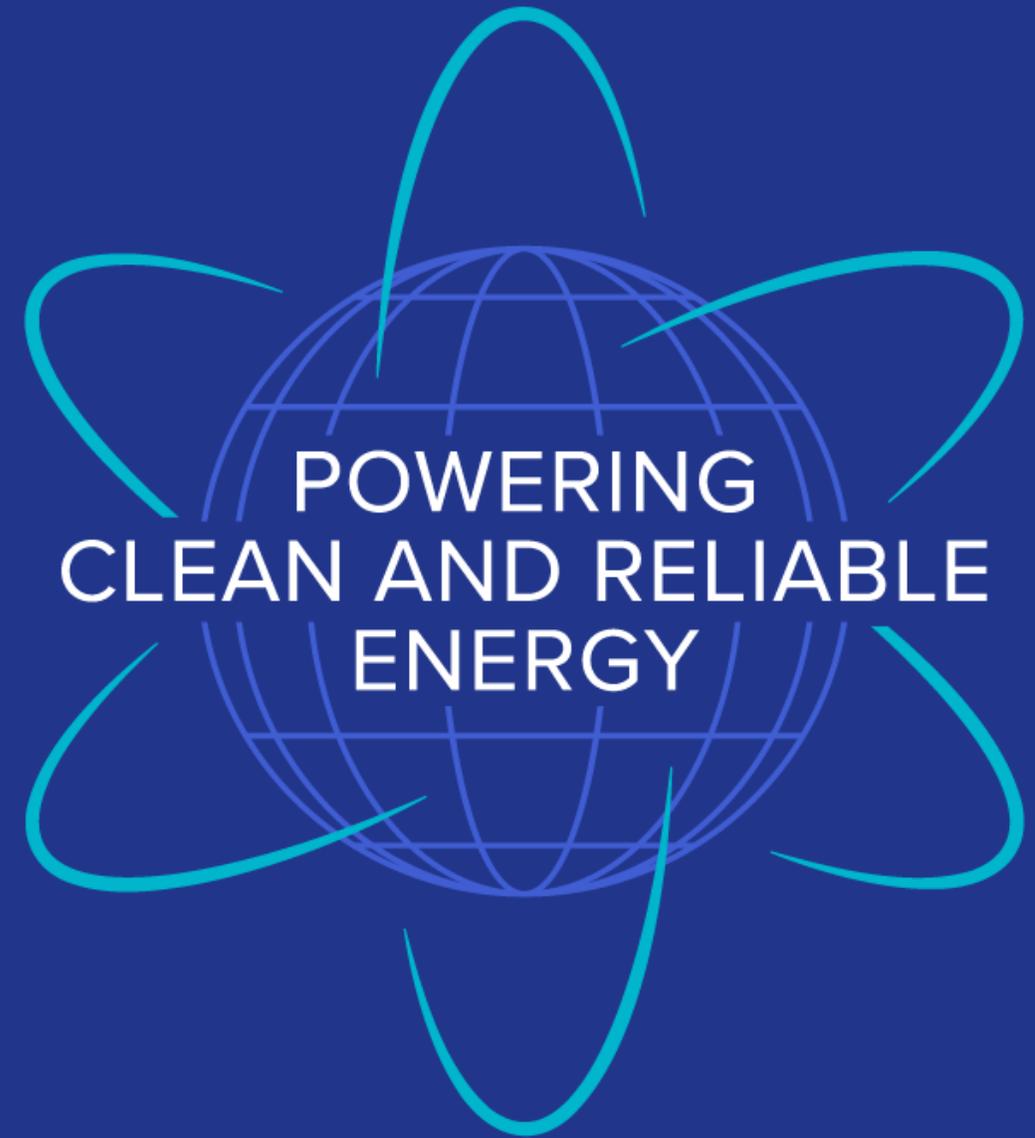


NEI 25-08 Graded Approach to Seismic Hazard Analysis and Corresponding Site Investigations for Licensing Nuclear Power Plants

Jon Facemire

Senior Project Manager, New Nuclear

January 15, 2026



Motivation

- Seismic aspects of site characterization for NPPs is resource-intensive in time and cost
- Current regulatory guidance was based on prescriptive, not performance-based
- New NPPs may come in all shapes and sizes:
 - Different reactor technologies and power output
 - Different sensitivity to seismic shaking
 - Different quantity of radiological materials
 - Different potential consequences in the event of failure
- Industry desires confidence in using alternative approaches where the scope of work scales with the seismic risk significance of the facility

Key Objectives

Propose a graded approach for seismic hazard and corresponding site characterization with the following attributes:

- applicability to the wide range of NPPs currently contemplated
- makes most use of existing and easily collected data
- scales based on relative safety/risk of various NPPs
- scales based on site seismicity and NPP seismic capacity

Use an initial screening/scoping step to inform what additional should be done to support NPP licensing.

Proposed Approach

1. Compute a “Seismic Index” that represents the importance of seismic hazard on plant design for a given site
2. Compute a “Consequence Index” that reflects the consequences of a radiological release from a facility.
3. Identify the appropriate “Gradation Tier” based on combination of Seismic Index and Consequence Index
4. Characterize appropriate details for site characterization methodology, and seismic hazard analysis methodology, for the applicable Gradation Tier

SECY-25-0052

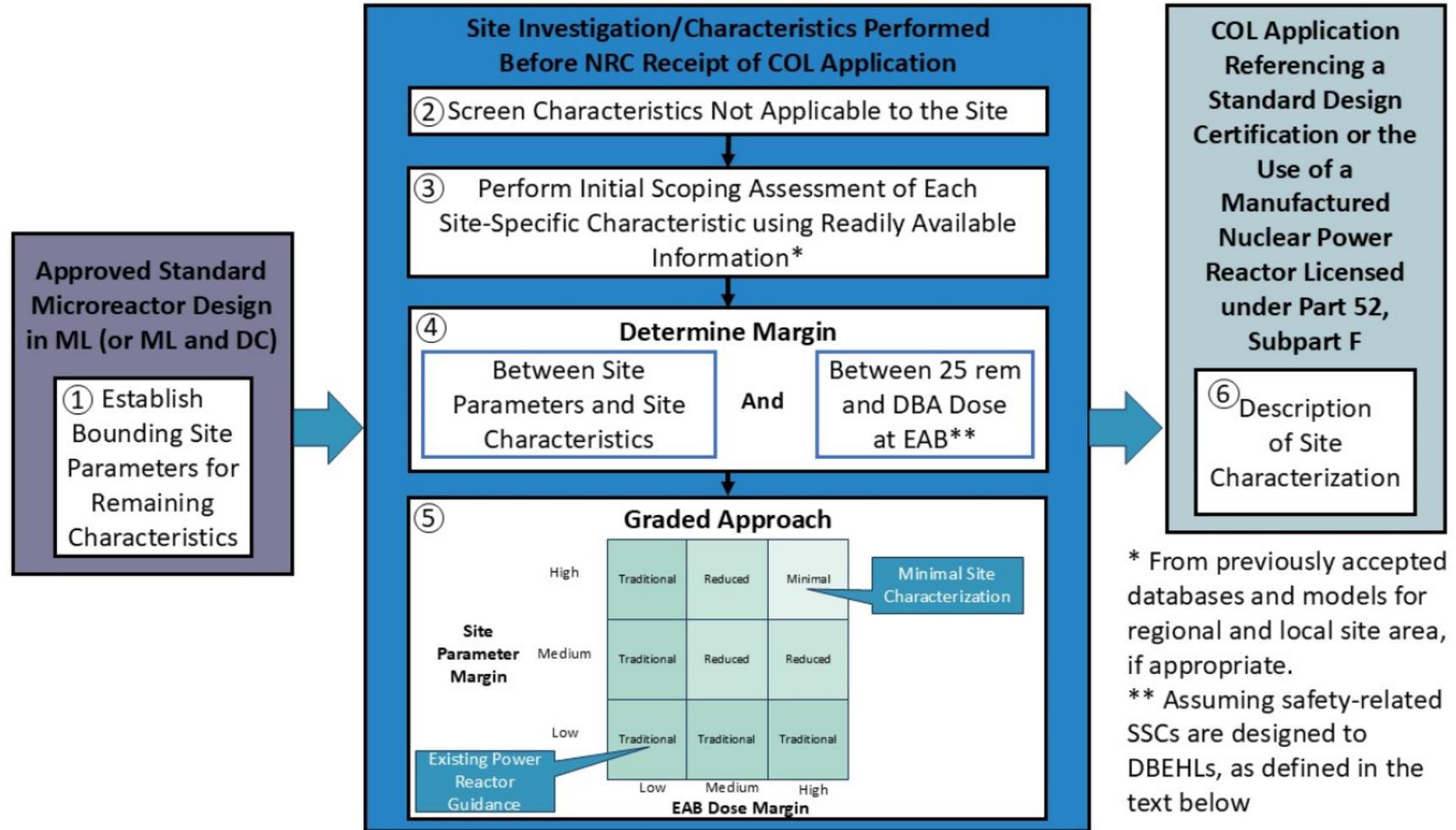


Figure 1 Conceptual approach for grading the level of site investigation and characterization

NEI 25-08

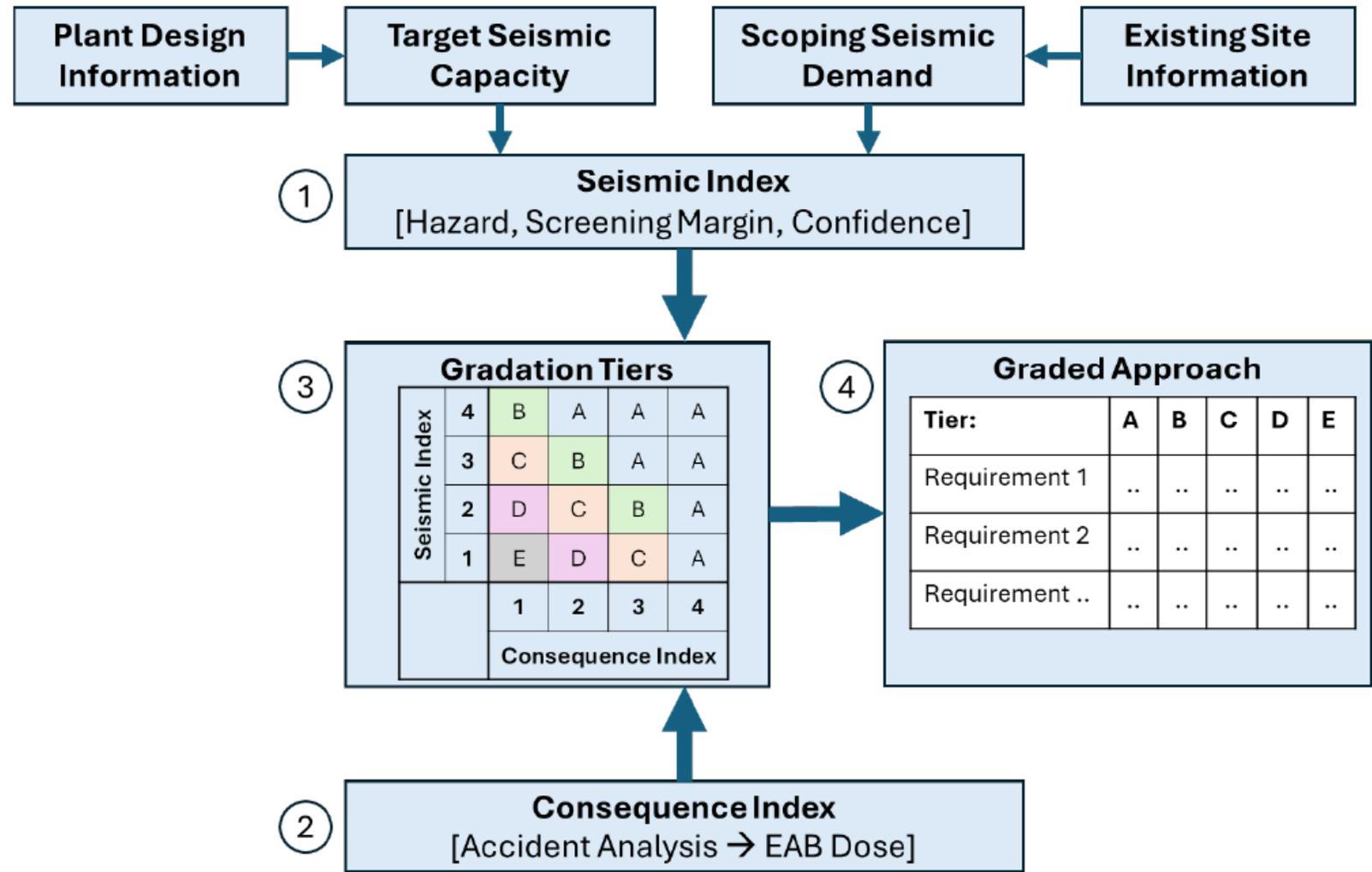
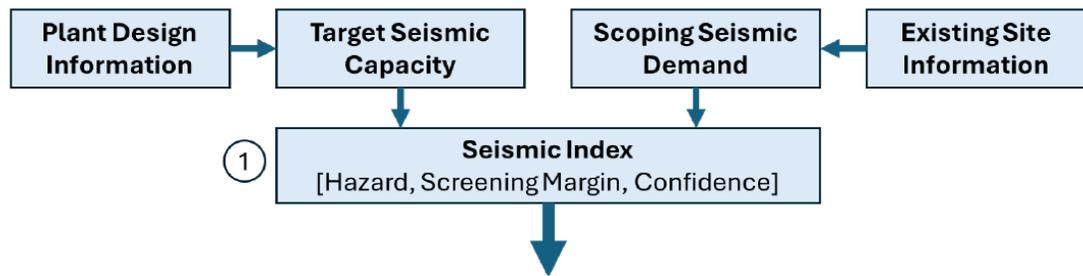
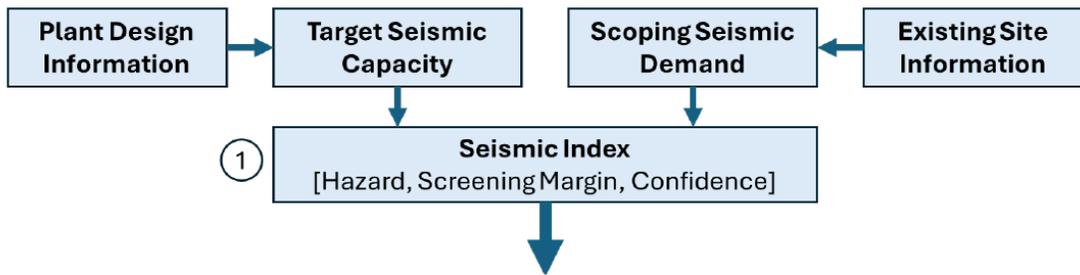


Figure 1: Framework for Graded Seismic Hazard and Site Characterization

Seismic Index



- **Target Seismic Capacity:** A horizontal ground motion spectrum defined in the preliminary plant design criteria representing the minimum level for which certain structures, systems, and components will be designed to remain functional.
- **Scoping Seismic Demand:** The response spectrum used for the initial screening assessment to represent potential ground shaking at the site. It is developed from existing and readily available information for the site, including a preliminary estimate of the site's seismic hazard according to the USGS NSHM.
- **Existing Site Information:** Site location and site subsurface information adequate to assign site class per ASCE 7 Ch. 20 (or supporting site-specific procedures per Ch. 21)



- **Seismic Index:** 1 thru 4 as a function of multiple characteristics [1=high importance]
 - **Seismic Screening Margin:** Ratio of DRS to MCE_R ; higher ratio relates to higher index
 - **Hazard:** Relative amplitude of MCE_R ; higher amplitude relates to lower index
 - **Confidence:** Uncertainty in DRS and/or MCE_R ; lower confidence relates to lower index

Map combination of Margin, Hazard, and Confidence to Seismic Index:

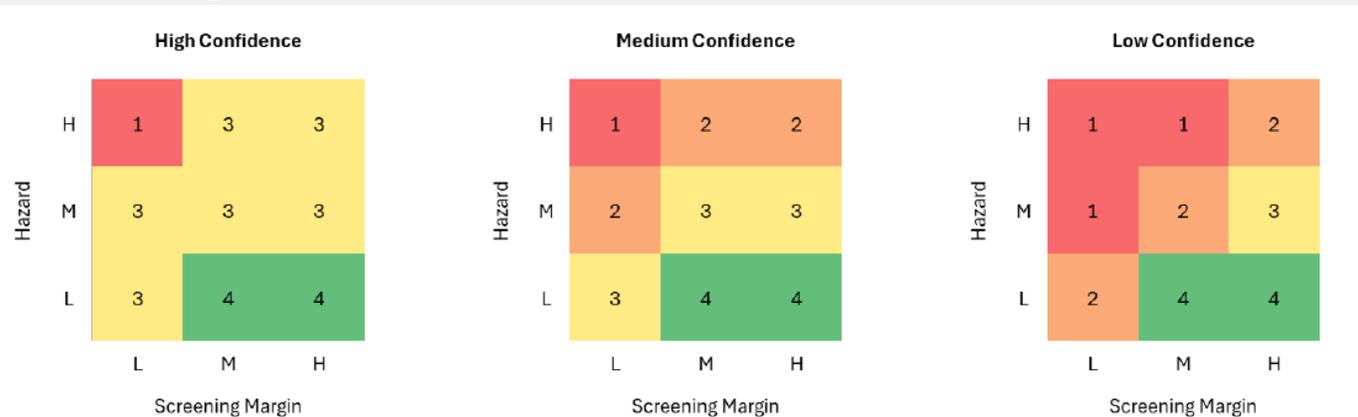


Figure 3: Mapping of Seismic Screening Margin, Hazard, and Confidence Parameters to Seismic Index

Consequence Index

②



Consequence Index
[Accident Analysis → EAB Dose]

- **Consequence Index:** 1 thru 4 as a function of consequence-based accident analysis [1=high significance]
 - Multiple options to accommodate various safety analysis strategies.
 - Each option has different consequence metric and threshold.
 - Intending to be aligned with other parallel industry efforts for risk-informing requirements.

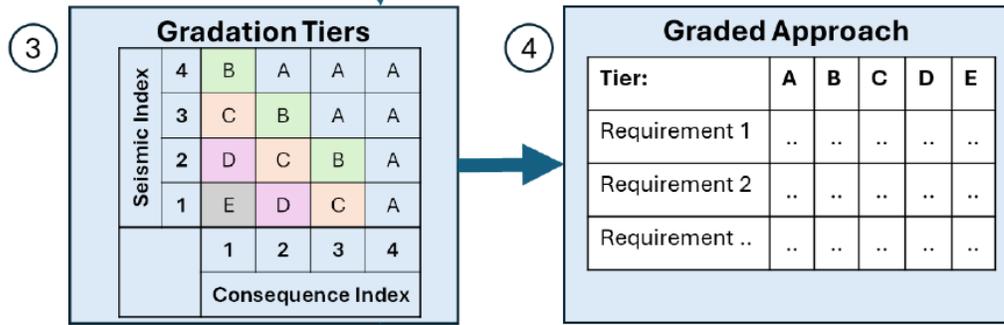
CI	Unmitigated Dose*	DBA Dose**	PEP EPZ***
4	< 0.25 Sv (25 rem TEDE)	<0.1 rem TEDE	No PEP EPZ
3	0.25 – 1 Sv (25 – 100 rem TEDE)	0.1 – 1 rem TEDE	EPZ at Site Boundary
2	1 - 5 Sv (100 – 500 rem TEDE)	1 – 10 rem TEDE	EPZ outside of Site Boundary but less than 10 mi
1	> 5 Sv (500 rem TEDE)	10 – 25 rem TEDE	10 mile (traditional)

* TEDE at EAB over 4 days consistent with ANS 2.26

** Total Effective Dose Equivalent (TEDE) at EAB over two 2-hour periods following the onset of the postulated fission product release for bounding DBA with credited SSCs to have reasonable confidence of having seismic capacity at least that considered in Seismic Index

*** Outcome of safety analysis used to define graded plume exposure pathway EPZ size (10 CFR 50.160)

Gradation Tiers



• **Gradation Tiers – Seismic and Consequence Index Mapping**

- **Tier A:** Sufficiently low consequence such that commercial standards apply. *Examples – Microreactors or SMRs w/ low hazard and high seismic screening margin*
- **Tier B:** Low consequence coupled with sufficiently low seismic importance to justify only limited seismic hazard analysis
Examples – Robust Passively safe plant with a High Seismic Screening Margin but more than Low Hazard. LLWR w/ low seismic hazard & high margin
- **Tier C:** Moderate consequence or moderate seismic importance to warrant moderate effort in seismic hazard analysis
Examples – Passively safe plant with a Low Seismic Screening Margin and High Hazard, LLWR with a Moderate Seismic Screening Margin and Hazard
- **Tier D:** Sufficiently high consequence and seismic importance to warrant a detailed seismic hazard analysis
Example – LLWR with High Seismic Screening Margin and High Hazard
- **Tier E:** Unique conditions warranting case-specific considerations.
Example – LLWR with a Low Seismic Screening Margin and High Hazard

Activity	Tier A	Tier B	Tier C	Tier D	Tier E
Compilation and Review of Existing Data	Required – Scope dictated by the need to meet the requirements listed below.				
Subsurface Characterization - Foundations	Consistent with “best practices” and commercial building code (e.g, ASCE 7, IBC).	Sufficient boreholes (with depth per Appendix D of RG 1.132) to justify an interpreted characterization of the materials below the footprint and to confirm the geotechnical foundation requirements. The number of boreholes should scale with the footprint of the facility, spaced no less than 100 ft apart with one near the center of the reactor; it is acceptable for facilities with small footprints to demonstrate area uniformity via surface geophysics.	Sufficient boreholes (with depth per Appendix D of RG 1.132) to construct justifiable site cross sections and confirm geotechnical foundation requirements. The number of boreholes should scale with the footprint of the facility, spaced no less than 100 ft apart but no fewer than five total (e.g., one near the center of the reactor and one near or beyond each corner of the facility).	Follow RG 1.132 Appendix D with guidance from Section 4.3 of ANS 2.27.	
Dynamic Site Profile Characterization	Based on ASCE 7 site class or site-specific analyses using published MRD curves.	Site-specific measured Vs profile from surface geophysics is acceptable. Provide a basis for using published modulus reduction and damping (MRD) curves.	Site-specific measured Vs profile from surface geophysics benchmarked to downhole measurements is acceptable. Provide a basis for using published MRD curves.	Follow RG 1.132 and 1.208 with guidance from ANS 2.27 and 2.29.	

Seismic Index	4	B	A	A	A
	3	C	B	A	A
	2	D	C	B	A
	1	E	D	C	A
	1	2	3	4	
	Consequence Index				

Seismic Index	4	B	A	A	A
	3	C	B	A	A
	2	D	C	B	A
	1	E	D	C	A
	1	2	3	4	
Consequence Index					

Activity	Tier A	Tier B	Tier C	Tier D	Tier E
Seismic Source Characterization (SSC)	Based on ASCE 7 with USGS NSHM or ASCE 7 with site-specific PSHA.	SSHAC Level 1 study. It is acceptable to use inputs consistent with USGS NSHM and perform due diligence for including other existing and available data not already in the USGS model.	SSHAC Level 1 or 2 study, depending on the suitability of pre-existing information and data to satisfy the guidance in ANS 2.29 for the SSC Model. Level 1 study could be only slightly more rigorous than what would be done for Tier B, with due diligence to supplement new investigation of potential additional sources (e.g., aerial photos and/or LiDAR). A Level 2 study would include querying other experts.	SSHAC Level 2 or 3 study, depending on the suitability of pre-existing information and data to satisfy the requirements in RG 1.208 and guidance in ANS 2.29 for the SSC Model.	SSHAC Level 3 study. Follow RG 1.208 with guidance from ANS 2.29.
Ground Motion Characterization (GMC)		SSHAC Level 1 study using available and applicable GMMs in a logic tree fashion.	SSHAC Level 1 or 2 study, depending on the suitability of pre-existing information and data to satisfy the guidance in ANS 2.29 for the GMC Model. Level 1 study would be the same as would be done for Tier B. Level 2 study would apply only for unique cases, such as a site on a boundary between existing GMMs (e.g., between CEUS and WUS).	SSHAC Level 2 or 3 study, depending on the suitability of pre-existing information and data to satisfy the requirements in RG 1.208, with guidance from ANS 2.29 for the GMC Model.	

Seismic Index	4	B	A	A	A
	3	C	B	A	A
	2	D	C	B	A
	1	E	D	C	A
	1	2	3	4	
Consequence Index					

Activity	Tier A	Tier B	Tier C	Tier D	Tier E
Site Response Analysis (SRA)	Based on ASCE 7 site class or site-specific analyses (ASCE 7 Chapter 21)	SSHAC Level 1 study. SRA can be decoupled from hazard computation (i.e., post-facto convolution as in Approach 2 of NUREG/CR-6728).	SSHAC Level 1 study with explicit treatment of uncertainty per guidance in ANS 2.29 for the SRA Model. SRA could be inside or outside of the hazard convolution integral, depending on the complexity of the site with respect to hazard uncertainties, informed by sensitivity analyses.	SSHAC Level 2 or 3 study, depending on the suitability of pre-existing information and data to satisfy the requirements in RG 1.208, with guidance from ANS 2.29 for the SRA Model.	SSHAC Level 3 study. Follow RG 1.208 with guidance from ANS 2.29.
		If site-specific Vs measurements show $V_{s30} > 1100$ m/s (3609 ft/s), ASCE 7 site class amplification factors may be used. However, the ergodic aleatory variability term must be used in PSHA calculations.			
Return Period of Interest for Seismic Design Criteria ⁵	Default from IBC and ASCE 7 for computing MCE_R	Consequence Index	Seismic Performance Target AEF (yr^{-1})	Implied AEF of UHRS basis for GMRS (or equiv.) (yr^{-1})	1E-5 / yr. Implies GMRS based on UHRS at AEF of 1E-4 and 1E-5 / yr.
		3	1E-4	1E-3 and 1E-4	
		2	4E-5	4E-4 and 4E-5	
		1	1E-5	1E-4 and 1E-5	

Review Process

Complete

- Tabletop with AR Stakeholders – Oklo & NuScale tabletops, feedback worked into report
- Member Review (Siting Task Force, NNLWG, NNEWG) incorporated into report

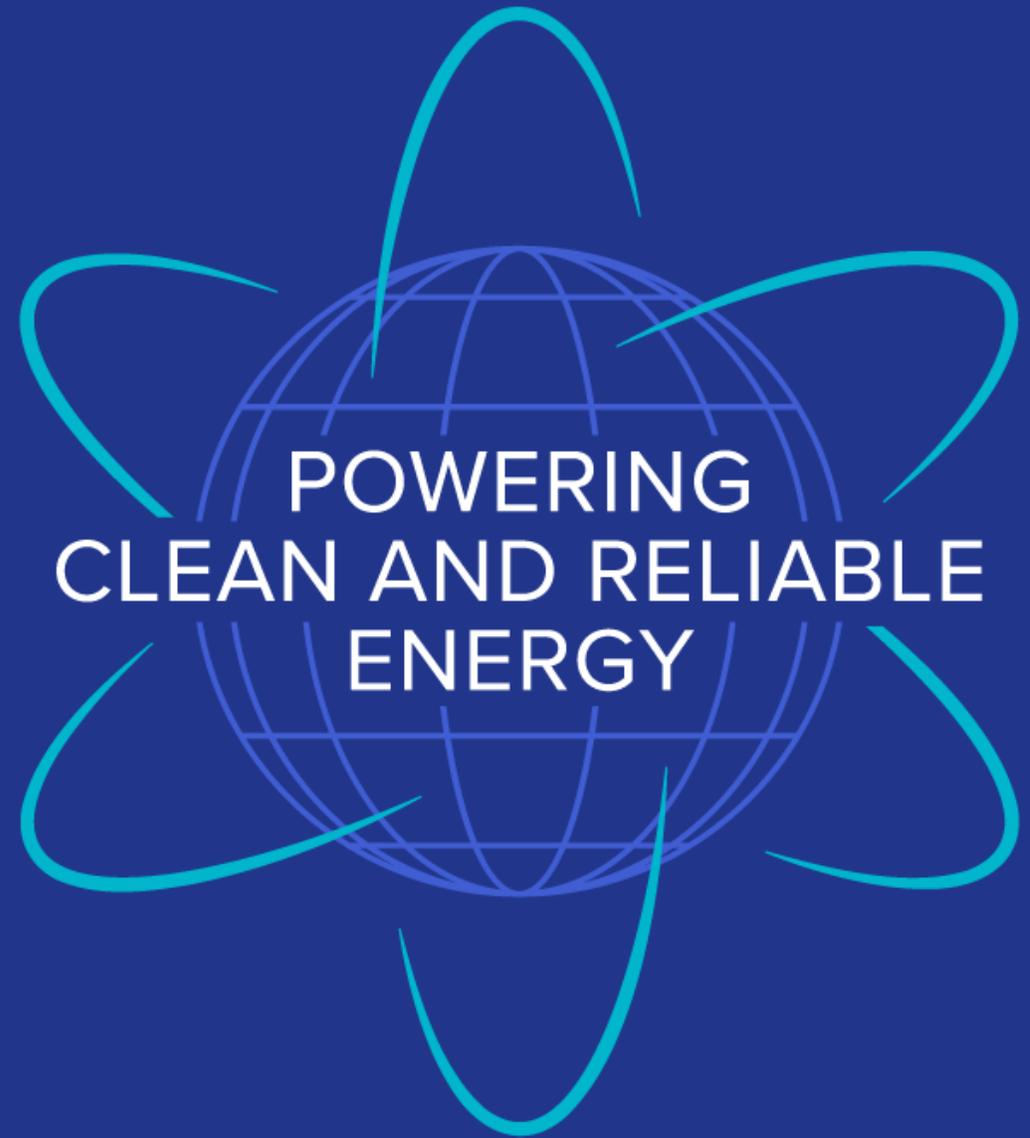
Next Steps

- NRC Engagement proposed for Q2 2026 to solicit feedback, updates to reflect wholesale rulemaking revision if needed.
- Final Methodology incorporating industry and NRC feedback submitted to NRC
- Goal is RG endorsing graded seismic characterization in 2026.

Risk Informed Technical Specifications (RITS) 2026 NEI Project

Jon Facemire
Senior Project Manager, New Nuclear

January 15, 2026



Acronyms

- CFR – Code of Federal Regulation
- CT – Completion Time
- DANU – Division of Advanced Reactors and Non-Power Production and Utilization Facilities
- EP – Expert Panel
- IDP – Integrated Decision-Making Process (or Panel)
- IDPP – Integrated Decision-Making Process Panel
- ISG – Interim Staff Guidance
- LCO – Limiting Condition of Operation
- LMP – Licensing Modernization Project
- LWRs – Light Water Reactors
- MANDEEP – Monitoring and NonDestructive Evaluation Expert Panel
- MREP – Maintenance Rule Expert Panel
- NEI – Nuclear Energy Institute
- NRC – Nuclear Regulatory Commission
- PRA – Probabilistic Risk Assessment
- RG – Regulatory Guide
- RICT – Risk Informed Completion Times
- RIMEP – Reliability Integrity Management Expert Panel
- RITS – Risk Informed Technical Specification
- SFCP – Surveillance Frequency Control Program
- STS – Standard Technical Specifications
- TS – Technical Specifications

Motivation

- DANU-ISG-2022-08 provides guidance for RITS and has statements such as: “Applicants may propose to locate time-based surveillance frequencies to a licensee-controlled program, called the surveillance frequency control program (SFCP), and add the SFCP to the administrative controls section of TS.”
 - ISG references NEI 04-10, Standard Technical Specification (STS), RG 1.177, RG 1.174, RG 1.200
- Much of the guidance referenced above was written for operating reactors or specifically for LWRs. Need to provide clarity on:
 - PRA expectations referencing RG 1.247 instead of RG 1.200
 - Alternative risk metrics and acceptance guidelines
 - Interface of NEI 18-04 IDP and RITS guidance. Efficiencies between NEI 18-04 IDPP and SFCP IDP? Other EPs, like RIMEP, MANDEEP, MREP
- Existing guidance assumes Tech Specs are being modified, does not provide information on setting initial SFs or LCO completion times.

Why this meeting now?

- NRC Rulemaking – “Regulatory Enhancements for Reactor Licensing, Decommissioning, and Operational Oversight” identifies 10 CFR 50.36 as a regulation expected to be amended. Is this informed by NRC-2024-0173?
- From DANU-ISG-2022-08: “In some cases, this correlation may be inconsistent with the regulation text as applied to a particular design, in which case the applicant should include an exemption request as part of its application.”
- Part of the proposed project scope was to provide further guidance on anticipated exemptions to 10 CFR 50.36. Should we wait on Proposed Rule Language prior to working on this guidance?
- Is there anything else in the proposed project that may conflict with the planned rulemakings?
- Any scope missing from NRC perspective?

Key Project Objectives

Develop guidance for Technical Specification development that is Technology-Inclusive as opposed to reliant on LWR precedent.

Supplement NEI 04-10 guidance for SFCP to 1) Use a technology-inclusive risk metric 2) Establish initial surveillances instead of updating existing frequencies 3) Update references and define interface with NEI 18-04, RG 1.247, RIM, etc.

Supplement NEI 06-09 guidance for Risk-Informed Completion Times (RICT) to 1) Use a technology-inclusive risk metric 2) Establish initial completion times (CTs) instead of updating existing CTs 3) Update references and define interface with NEI 18-04, RG 1.247, etc.

Provide clear guidelines for exemptions to 10 CFR 50.36 and / or feedback to NRC wholesale revision rulemaking.

Verify no further guidance is needed for setpoint control program

Any other needs identified by future licensees.

Planned Outline

1. Purpose – Provide guidance to meet the 10 CFR 50.36 regulation with anticipated exemptions / rules of particular applicability (ROPA) if needed.
2. Background – 10 CFR 50.36, NEI 18-04/RG 1.233, DANU-ISG-2022-08, NEI 04-10, NEI 06-09, RG 1.105, Part 53, Part 57
3. Surveillance Frequency Control Program – NEI 04-10 Supplement
4. Risk-Informed Completion Times – NEI 06-09 Supplement
5. Other Miscellaneous Guidance needed for Tech Spec Development

Questions

For NRC

- Will planned rulemakings significantly impact project scope?
- Any NRC concern with planned path forward?

For Industry

- Any interest in joining RITS working group?

For Anyone

- Any scope missing?
- Feedback on Technology-Inclusive vs guidance based on reactor type