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	Guidance
Strategy 4	Consensus Codes and Standards
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Strategy 6	Communication

Legend

Concurrence (Division/Interoffice)	● EDO Concurrence Period
Federal Register Publication	Commission Review Period**
Public Comment Period	▼ ACRS SC/FC (Scheduled or Planned)
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Final Issuance of Deliverable	↓ Public Meeting (Scheduled or Planned)

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Present Day

Strategy	Regulatory Activity	Commission Papers	Guidance	Rulemaking	NEIMA	Complete	2022 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2023 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))					x																								
	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																													
	Reference plant model for Heat Pipe-Cooled Micro Reactor					x																								
	*Reference plant model for Sodium-Cooled Fast Reactor (update from version 1 to 2)****																													
	*Reference plant model for Molten-Salt-Cooled Pebble Bed Reactor (update from version 1 to 2)****					x																								
	Reference plant model for Monolith-type Micro-Reactor																													
	*Reference plant model for Gas-Cooled Pebble Bed Reactor (update from version 1 to 2)****					x																								
	*Reference plant model for Molten-Salt-Fueled Thermal Reactor (update from version 1 to 2)****																													
	Code Assessment Reports Volume 2 (Fuel Perf. Anaylsis)					x																								
	FAST code assessment for metallic fuel					x																								
	FAST code assessment for TRISO fuel					x																								
	Code Assessment Reports Volume 3 (Source Term Analysis)					x																								
	Non-LWR MELCOR (Source Term) Demonstration Project					x									↓															
	Reference SCALE/MELCOR plant model for Heat Pipe-Cooled Micro Reactor					x																								
	Reference SCALE/MELCOR plant model for High-Temperature Gas-Cooled Reactor					x																								
	Reference SCALE/MELCOR plant model for Molten Salt Cooled Pebble Bed Reactor					x																								
	Reference SCALE/MELCOR plant model for Sodium-Cooled Fast Reactor					x																								
	Reference SCALE/MELCOR plant model for Molten Salt Fueled Reactor					x																								
	MACCS near-field atmospheric transport and dispersion model assessment					x																								
	MACCS near-field atmospheric transport and dispersion model improvement					x																								
	MACCS radionuclide screening analysis					x																								
	MACCS radionuclide properties on atmospheric transport and dosimetry					x																								
	MACCS: Evolution of Radionuclide Properties in the Atmosphere																													
	MACCS: Assessment of Capabilities for Assessing Tritium Releases																													
	MACCS: Demonstration Project for Advanced Reactors: Heat Pipe Reactor					x																								
	Code Assessment Report Volume 4 (Licensing and Siting Dose Assessments)					x																								
	Phase 1 – SIERRA (Atmospheric Code Consolidation)																													
	Phase 2 - SIERRA (Effluent Code Consolidation)																													
	Phase 3 - Habitability Code Consolidation																													
	Code Assessment Report Volume 5 (Fuel Cycle Analysis)					x																								
	Reference SCALE/MELCOR fuel cycle analysis for High-Temperature Gas-Cooled Reactor					x														↓										
	Reference SCALE/MELCOR fuel cycle analysis for Sodium-Cooled Fast Reactor																										↓			
	Research plan and accomplishments in Materials, Chemistry, and Component Integrity for Adv. Rxs.					x																								
	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																								
	Develop Fuel Qualification Guidance for Adv. Rxs (NUREG-2246)		x		x	x																								
	Develop Advanced Reactor Content of Application Project (ARCAP) Regulatory Guidance		x																					↓						▼

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3	Develop Advanced Reactor Technology Inclusive Content of Application Project (TICAP) Regulatory Guidance		x				↓																	↓						▼
	Develop non-LWR Construction Permit Guidance																							↓						▼
	Develop non-LWR Design Review Guide (DRG) for Instrumentation and Controls reviews		x			x														↓	↓	↓		↓						
	Develop Advanced Reactor Inspection and Oversight Program Framework		x																		↓			↓						
	Technology Inclusive Risk-Informed Change Evaluation (TIRICE) Guidance Endorsement										↓			↓									↓							
	Technology Inclusive Management of Safety Case (TIMASC) Guidance Endorsement																						↓							
	Develop Regulatory Guide for Licensing Modernization Project		x			x																								
	Develop non-LWR Source Term Information (NEIMA Section 103(c)(4)(II)		x		x	x																								
	Develop Molten Salt Reactor fuel qualification guidance (NUREG/CR-7299)																													
	Interim MSR fuel qualification guidance					x																								
	Final MSR fuel qualification guidance					x																								
	Develop guidance for Non-power Liquid Fueled Molten Salt Reactors (NEIMA Section 103(a)(3))		x		x	x																								
	Review of non-LWR Fuel Cycle Assessment of Regulatory Infrastructure.																													
	Develop Report on possible Material Control and Accounting Approaches for a Pebble Bed Reactor.					x																								
	Develop Metal Fuel Fabrication Safety and Hazards Final Report					x																								
	Develop Review of Hazards for Molten Salt Reactor Fuel Processing Operations					x																								
	Review of Operating Experience for Transportation of Fresh (Unirradiated) Advanced Reactor Fuel Types					x																								
	Potential Challenges with Transportation of Fresh (Unirradiated) Advanced Reactor Fuel Types					x																								
	Storage Experience with Spent (Irradiated) Advanced Reactor Fuel Types					x																								
	Potential Challenges with Storage of Spent (Irradiated) Advanced Reactor Fuel Types					x																								
	Transportation Experience and Potential Challenges with Transportation of Spent (Irradiated) Adv. Rx Fuel Types					x																								
	Disposal Options and Potential Challenges to Waste Packages and Waste Forms in Disposal of Spent (Irradiated) Advanced Reactor Fuel					x																								
	Information Gaps and Potential Information Needs Associated with Transportation of Fresh (Unirradiated) Adv. Rx Fuel Types					x																								
	Develop MC&A guidance for Cat II facilities (NUREG-2159)					x																								
	Material Compatibility Interim Staff Guidance (DANU-ISG-2023-01)																				↓					▼				
	Non-LWR PRA Standard Applicability Interim Staff Guidance (DANU-ISG-2023-02)																											↓		
	Methodology and Guidance on the Treatment of Consequence Uncertainty																													↓
	Facility Training Programs Interim Staff Guidance (DRO-ISG-2023-04)																					↓		↓						
	Draft Regulatory Guides for risk-informed and performance-based (RIPB) seismic design approaches and adopting seismic isolation technologies															↓														
	Develop contractor report on technology-inclusive human factors engineering reviews					x																								
	Develop supplemental human factors engineering review guidance associated with four technical areas where we have identified knowledge gaps																													
4	Develop Regulatory Guide for endorsement of the non-LWR Probabilistic Risk Assessment Standard		x						↓								↓													
	RG 1.87 Rev 2 for endorsement of the ASME Section III, Division 5, "High Temperature Reactors" and technical basis NUREG-2245		x			x																								
	Alloy 617 Code Cases (N-872 and N-898)					x																								
	Develop Regulatory Guide endorsing ASME Section XI Division 2 Reliability and Integrity Management (RIM)					x																								
	Develop SECY paper related to Consequence Based Security (SECY-18-0076)					x																								

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5	Develop SECY paper related to EP for Small Modular Reactors and Other New Technologies (SECY-18-0103)				x	x																								
	Develop SECY paper related to Functional Containment (SECY-18-0096)				x	x																								
	SECY-20-0093 Policy and Licensing Considerations related to Micro Reactors	x				x																								
	Report regarding review of the insurance and liability for advanced reactors (Price-Anderson Act)	x				x																								
	Annual Fees for Non-Light Water Reactors and Microreactors																													
	Develop SECY Paper regarding Population-Related Siting Considerations for Advanced Reactors	x				x																								
	Revise Regulatory Guide (RG) 4.7 to implement SRM to SECY-20-0045	x	x																											
6	Develop annual SECY paper regarding status of non-LWR activities	x																												
	NRC DOE Workshops					x																								
Rulemaking	Part 53 Plan - Risk-Informed, Technology Inclusive Regulatory Framework for Advanced Reactors (NEIMA Section 103(a)(4))			x	x											▼	▼						↓							
	Public Meetings						↓	↓	↓		↓	↓	↓	↓		↓		↓							↓						
	ACRS Interactions							▼			▼	▼	▼			▼	▼													
	Physical Security for Advanced Reactors			x			↓						●																	
	Develop draft Generic Environmental Impact Statement for Advanced Reactors. Final GEIS.*(Has been voted to rulemaking by Comm.)			x																										
	Emergency Preparedness Requirements for Small Modular Reactors and Other New Technologies.(NEIMA Section 103(a)(2))			x	x																									

*Dates reflected above are best estimates. Actual dates will be updated as additional information becomes available.

**The timeframe for the Commission's review is for planning purposes only, and does not reflect an expected date for Commission decision.

For additional technical and policy issues related to Adv. Rxs, please visit: https://www.nrc.gov/reactors/new-reactors/smr.html#techPolicyIssues