

Advanced Reactor Content of Application Project  
(ARCAP) Interim Staff Guidance (ISG) Documents and  
Technology Inclusive Content of Application Project  
(TICAP) Guidance Final Documents



# Purpose and Agenda

- Provide a high-level overview of the Technology Inclusive Content of Application Project (TICAP) Regulatory Guide 1.253 and the nine Advanced Reactor Content of Application Project (ARCAP) Interim Staff Guidance Documents
  - Include overview of the comments received and the NRC's disposition of these comments
- Agenda
  - High-level overview of ARCAP and TICAP structure
  - Discussion of Regulatory Guide 1.253 (TICAP Guidance)
  - Discussion of ARCAP interim staff guidance documents

# ARCAP/TICAP Background

- Overview of ARCAP/TICAP draft guidance documents provided during an advanced reactor stakeholder public meeting on June 7, 2023
  - Overview included a discussion of changes to draft guidance documents from white paper versions of the documents
  - See slides 96 through 144 at [ML23157A018](#)
    - Includes both NRC staff slides and Nuclear Energy Institute slides
  - Meeting occurred during the open comment period for the documents
    - Included information on how to provide comments on documents
- Public meeting held on August 22, 2023 (after public comment period ended), to provide commenters an opportunity to discuss their comments
  - Meeting summary available at: [ML23236A481](#)

# ARCAP/TICAP Background

- Public meeting held on September 26, 2023, to discuss DG-1404, Revision 1
  - DG-1404, Revision 1, included additional guidance related to construction permit probabilistic risk assessment development
  - Meeting held during public comment period
    - Purpose was to facilitate stakeholder understanding of guidance and to provide information on how to provide comments on the draft guidance
  - Meeting slides available at: [ML23265A185](#)
  
- ACRS Meetings
  - Future Plant Designs Subcommittee briefing held on November 16, 2023, provided an overview of the comments received and the staff's disposition of these comments.
    - Meeting transcript available at [ML23352A396](#)
  - ACRS Full Committee Briefing held on December 6, 2023, provided a high-level overview of the ARCAP and TICAP structure, and guidance documents
    - Meeting transcript available at [ML24017A222](#)
    - ACRS letter issued on December 20, 2023, is available at [ML23348A182](#)
    - Staff response issued on March 18, 2024, is available at [ML24024A025](#)

# ARCAP/TICAP Background

- Final ARCAP ISG documents issued on March 31, 2024. Document package available at: [ML24073A229](#) that includes 28 documents:
  - Nine final versions of the ISGs,
  - Nine comment resolution tables,
  - Nine redline strikeout versions
    - Provides a comment identification that includes a reason for the change
  - The ACRS letter response
- TICAP RG 1.253 issued in March 2024. Document package available at: [ML23269A047](#) includes:
  - Final version of RG
  - Comment resolution table
  - Redline strikeout version
    - Provides a comment identification that includes a reason for the change
- ARCAP/TICAP Public Webpage provides links to key meetings and documents associated with the development of these documents (see: <https://www.nrc.gov/reactors/new-reactors/advanced/rulemaking-and-guidance/advanced-reactor-content-of-application-project.html>)



## Background – How to Access Final Documents and Comments

- All of the documents are available in Table 1 of the public ARCAP/TICAP webpage <https://www.nrc.gov/reactors/new-reactors/advanced/rulemaking-and-guidance/advanced-reactor-content-of-application-project.html>

ARCAP ISG Title	ADAMS Accession #	Regulations.gov Docket ID	# of Comments
DANU-ISG-2022-01, Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications – Roadmap	<a href="#">ML23277A139</a>	<a href="#">NRC-2022-0074</a>	68
DANU-ISG-2022-02, Chapter 2, “Site Information”	<a href="#">ML23277A140</a>	<a href="#">NRC-2022-0075</a>	12
DANU-ISG-2022-03, Chapter 9, “Control of Routine Plant Radioactive Effluents, Plant Contamination and Solid Waste	<a href="#">ML23277A141</a>	<a href="#">NRC-2022-0076</a>	13
DANU-ISG-2022-04, Chapter 10, “Control of Occupational Doses”	<a href="#">ML23277A142</a>	<a href="#">NRC-2022-0077</a>	2
DANU-ISG-2022-05, Chapter 11, “Organization and Human-System Consideration”	<a href="#">ML23277A143</a>	<a href="#">NRC-2022-0078</a>	12
DANU-ISG-2022-06, Chapter 12, “Post Construction Inspection, Testing and Analysis Program”	<a href="#">ML23277A144</a>	<a href="#">NRC-2022-0079</a>	9
DANU-ISG-2022-07, “Risk-Informed ISI/IST Programs”	<a href="#">ML23277A145</a>	<a href="#">NRC-2022-0080</a>	43
DANU-ISG-2022-08, “Licensing Modernization Project-based Approach for Developing Technical Specifications”	<a href="#">ML23277A146</a>	<a href="#">NRC-2022-0081</a>	8
DANU-ISG-2022-09, “Risk-Informed, Performance-Based Fire Protection Program (for Operations)”	<a href="#">ML23277A147</a>	<a href="#">NRC-2022-0082</a>	23
Regulatory Guide 1.253, “Guidance for a Technology Inclusive Content of Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Advanced Reactors”	<a href="#">ML23269A222</a>	<a href="#">NRC-2022-0073</a>	73, 30*

\* 73 Comments on DG-1404 Rev 0, 30 comments on DG-1404 Rev 1

# ARCAP/TICAP Background

- Guidance is for developing and reviewing technology-inclusive, risk-informed, and performance-based non-light water (non-LWR) applications
- Developed to support 10 CFR Part 50 and 10 CFR Part 52 applications
  - Needed to support expected near-term non-LWR Part 50/52 applications using the licensing modernization project (LMP) process in NEI 18-04, Revision 1
- The NRC staff intends to revise the guidance per the final Part 53 rulemaking language

# ARCAP Background

- Broad in nature and intended to cover guidance for non-LWR applications for:
  - combined licenses
  - construction permits
  - operating licenses
  - design certifications
  - standard design approvals\*
  - manufacturing licenses\*
- Encompasses TICAP
  - TICAP is guidance for off-normal reactor states only.
    - ARCAP encompasses everything needed for a license application.

\* RG 1.253 does not currently address MLs and SDAs. ML and SDA applicants are encouraged to discuss their plans to use the RG with the NRC during the preapplication phase



# TICAP Background

- TICAP scope is governed by the LMP-based process
  - LMP uses risk-informed, performance-based approach to select licensing basis events, develop structures, systems, and components (SSC) categorization, and ensure that defense-in-depth is considered
- Industry developed key portions of TICAP guidance
  - See NEI 21-07, Revision 1, “Technology Inclusive Guidance for Non-Light Water Reactors Safety Analysis Report Content for Applicants Utilizing NEI 18-04 Methodology,” (ADAMS Accession No. [ML22060A190](#))
- RG 1.253 (issued as DG-1404) endorses NEI 21-07, Revision 1, with clarifications and additions
  - There are no proposed exceptions

# ARCAP and TICAP - Nexus

## Outline Safety Analysis Report (SAR) – Based on TICAP Guidance

1. General Plant Information, Site Description, and Overview
2. Methodologies and Analyses and Site Information\*
3. Licensing Basis Event (LBE) Analysis
4. Integrated Evaluations
5. Safety Functions, Design Criteria, and SSC Safety Classification
6. Safety Related SSC Criteria and Capabilities
7. Non-safety related with special treatment SSC Criteria and Capabilities
8. Plant Programs

## Additional SAR Content –Outside the Scope of TICAP

9. Control of Routine Plant Radioactive Effluents, Plant Contamination, and Solid Waste
10. Control of Occupational Doses
11. Organization and Human-System Considerations
12. Post-construction Inspection, Testing and Analysis Programs

## Audit/inspection of Applicant Records

- Calculations
- Analyses
- P&IDs
- System Descriptions
- Design Drawings
- Design Specs
- Procurement Specs
- Probabilistic Risk Assessment

## Additional Portions of Application

- Technical Specifications
- Technical Requirements Manual
- Quality Assurance Plan (design)
- Fire Protection Program (design)
- Quality Assurance Plan (construction and operations)
- Emergency Plan
- Security Plan
- Cyber Security Plan
- SNM physical protection program
- SNM material control and accounting
- Fire Protection Program (operational)
- Radiation Protection Program
- Offsite Dose Calculation Manual
- Inservice inspection/Inservice testing (ISI/IST) Program
- Environmental Report and Site Redress Plan
- Financial Qualification and Insurance and Liability
- Fitness for Duty Program
- Aircraft Impact Assessment
- Performance Demonstration Requirements
- Nuclear Waste Policy Act
- Operational Programs
- Exemptions, Departures, and Variances )

\* SAR Chapter 2 derived from TICAP guidance as supplemented by ARCAP interim staff guidance Chapter 2, "Site Information"

- Safety Analysis Report (SAR) structure based on clean sheet approach
- Additional contents of application may exist only in the SAR, may be in a separate document incorporated into the SAR, or may exist only outside the SAR.
- The above list is for illustration purposes only.

## TICAP and ARCAP Roadmap Common Guidance

- Applicability is only for non-LWRs
  - Recommends that light-water reactor applicants wanting to use ARCAP/TICAP guidance engage in pre-application discussions
- All ISGs provide applicant guidance and NRC staff review guidance in separate sections
- Appendices in several ISGs list in-development guidance documents that could affect future revision of those ISGs

# TICAP and ARCAP Roadmap Common Guidance

- Importance of Principal Design Criteria (PDC)
  - TICAP guidance covers PDCs associated with the licensing modernization project (i.e., those associated with off-normal conditions)
  - ARCAP Roadmap ISG and associated ISGs (e.g., ARCAP Chapter 9) contains PDC guidance for normal operations
  - RG 1.232, “Guidance For Developing Principal Design Criteria For Non-light-water Reactors,” ([ML17325A611](#)) provides additional guidance for reviewer consideration
  - ARCAP Roadmap ISG recommends discussion of PDC during preapplication phase

RG 1.253, Revision 0

*Guidance for a Technology-Inclusive Content-of-Application Methodology  
to Inform the Licensing Basis and Content of Applications for Licenses,  
Certifications, and Approvals for Non-Light-Water Reactors*

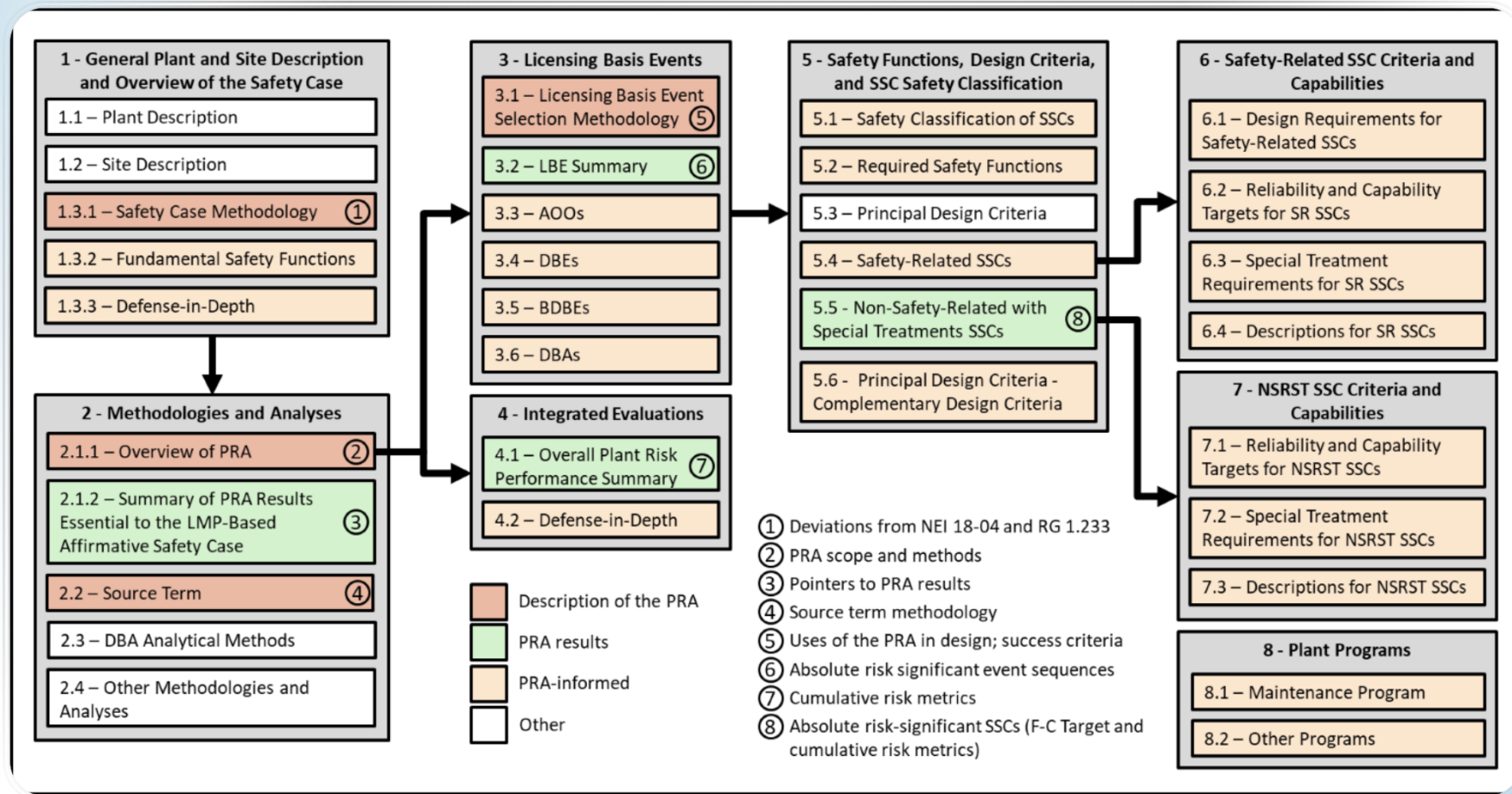
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Staff Endorsement of the  
Technology Inclusive Content of Application Project

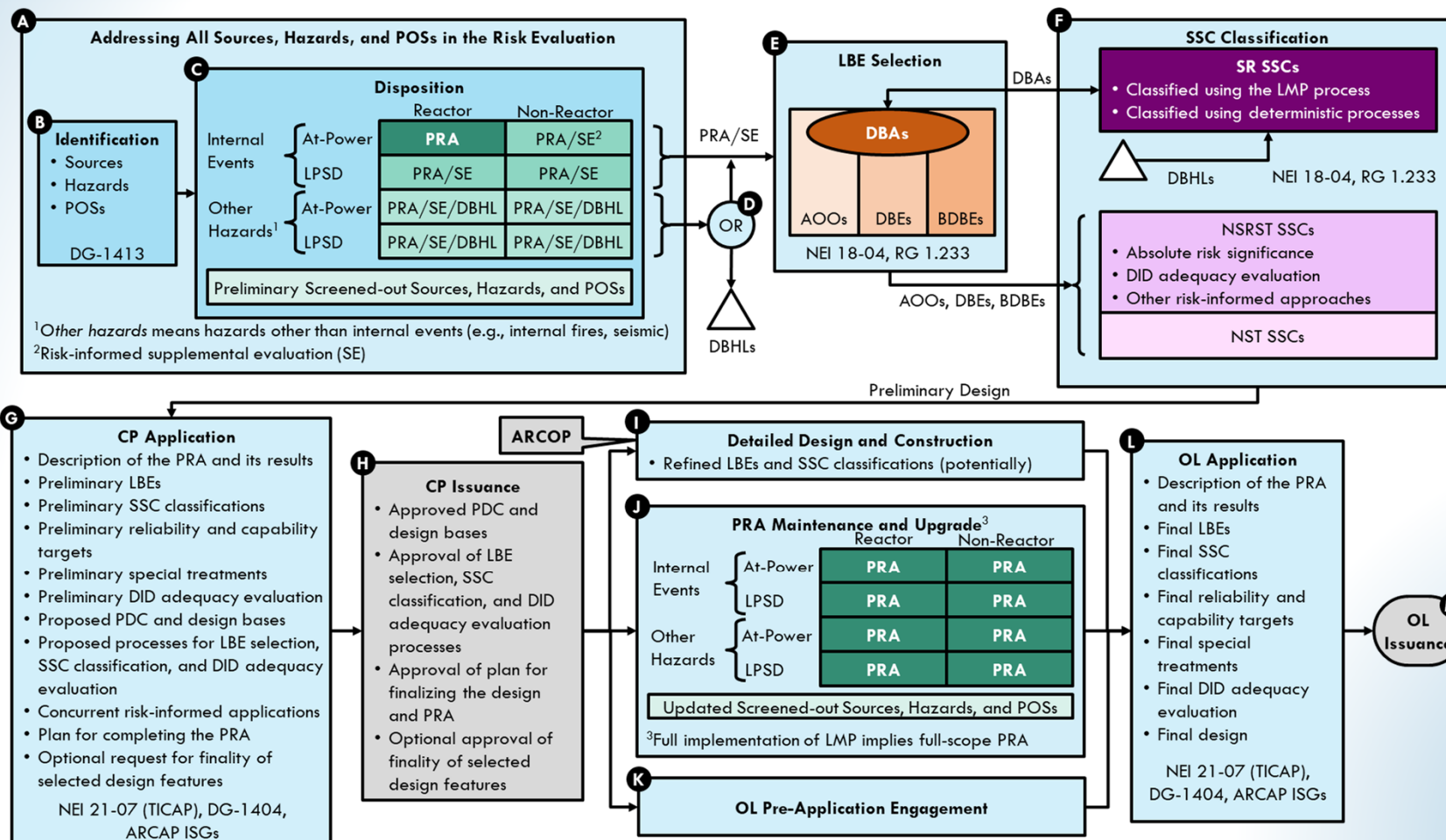
# TICAP – High Level Overview

- Establishes technology-inclusive guidance proposing an optional formulation of advanced reactor application content based on a risk-informed, performance-based approach for demonstrating plant safety meets the underlying intent of the current requirements.
- Intended to increase efficiency of developing and reviewing an application
- Scope is governed by the LMP methodology to facilitate a systematic, technically acceptable, and predictable approach for developing key portions of a design's SAR
  - The LMP methodology provides processes for identifying LBEs, classifying and establishing special treatments for certain SSCs, and ensuring DID adequacy
- The LMP methodology is based on a full-scope probabilistic risk assessment (PRA)
  - All sources of radiological material,
  - All hazards,
  - All plant operating states,
  - Full analysis of scenario progressions (i.e., analyzed from initiator to radiological consequence)

# TICAP Guidance



# TICAP Construction Permit/Operating License Guidance





# Construction Permit PRA Acceptability

## Key Points from RG 1.253, Revision 0:

- All sources, hazards, and plant operating states (POSs) should be addressed (i.e., identified and dispositioned) in the CP application, where *dispositioned* means each item is either:
  - Modeled in the PRA logic model,\*
  - Screened out of the PRA logic model with justification,\*
  - Accounted for using risk-informed supplemental evaluations, or
  - Accounted for using design-basis hazard levels (DBHLs) for hazards other than internal events
- As a minimum, the LMP-based CP application should be supported by an internal events, at-power, reactor PRA logic model, which represents the fundamental plant response model that:
  - helps demonstrate the applicant's ability to develop an acceptable PRA logic model and
  - establishes an acceptable foundation for upgrading the PRA logic model as the design progresses
- While acceptable for the CP stage of licensing, achieving only the minimum scope of the PRA logic model may not realize the full benefit of the LMP methodology at the CP stage

NOTE: Generally referring to *the PRA* implies these three items

\* The ASME/ANS non-LWR PRA consensus standard, ASME/ANS RA-S-1.4-2021, provides requirements and processes for defining the scope of the CP PRA logic model.

# Construction Permit PRA Acceptability

## Key Points from RG 1.253, Revision 0 (continued):

- A self-assessment of the PRA logic model, screening analyses, and risk-informed supplementary evaluations helps reduce the need for in-depth NRC review
  - This could be a peer review but is not required as such
- The CP application should provide a preliminary, yet complete\*\*, set of LBEs and SSC classifications
- Further expectations
  - The CP application should provide a plan for maintaining and upgrading the PRA during construction.
    - Example: Replacing a seismic DBHL with a seismic PRA
    - CP holders are encouraged to keep the staff advised of changes to the PRA completion plan that significantly affect the design.

\*\* Consistent with the maturity of design information and relative to the scope of the PRA logic model, screening analyses, and risk-informed supplementary evaluations supporting the CP application.

# DG-1404 Comment Resolution

- Seventy-three comments received on DG-1404, Revision 0
- Thirty comments received on DG-1404, Revision 1
- Resolution of public comment on DG-1404 is publicly available ([ML23269A223](#))
- Staff briefed ACRS Subcommittee on Regulatory Rulemaking, Policies, and Practices on the comment resolution on 11/16/23 ([ML23352A396](#))

# DG-1404 Comment Resolution

- Staff briefed ACRS Full Committee on comment resolutions on 12/6/23 ([ML24017A222](#)).
- Changes resulting from ACRS comments:
  - Guidance added regarding expectation that SAR identify any design requirements or special treatment of SSCs to prevent or mitigate cliff-edge effects, which should be included in the SSC-specific descriptions in subsequent SAR chapters (See staff response to ACRS Full Committee Letter under ADAMS Accession No. [ML24024A025](#)).

# Advanced Reactor Content of Application Project Roadmap – Overview and Discussion of Comments

# ARCAP Roadmap Overview

- Provides guidance for other portions of the application outside of ISGs including emergency plan, security, financial qualification and insurance and liability
- Includes four appendices
  - Appendix A – Preapplication Guidance
  - Appendix B – Applicability of Regulations to non-light water reactors
  - Appendix C – Construction Permit Guidance
  - Appendix D – Draft Documents Under Development

- Additional Portions of Application**
- Technical Specifications
  - Technical Requirements Manual
  - Quality Assurance Plan (design)
  - Fire Protection Program (design)
  - Quality Assurance Plan (construction and operations)
  - Emergency Plan
  - Security Plan
  - Cyber Security Plan
  - SNM physical protection program
  - SNM material control and accounting
  - Fire Protection Program (operational)
  - Radiation Protection Program
  - Offsite Dose Calculation Manual
  - Inservice inspection/Inservice testing (ISI/IST) Program
  - Environmental Report and Site Redress Plan
  - Financial Qualification and Insurance and Liability
  - Fitness for Duty Program
  - Aircraft Impact Assessment
  - Performance Demonstration Requirements
  - Nuclear Waste Policy Act
  - Operational Programs

# ARCAP Roadmap Comments

- Sixty-eight comments received
- Represents second most comments received on ARCAP/TICAP guidance documents
- Changes made because of comments:
  - Expanded the applicability of Appendix B (Applicability of Regulations to Non-LWRs) to Manufacturing License applications.
  - Deleted reference to the Facility Safety Program.
  - Expanded guidance on leaks from coolant systems to specifically address leaks from low pressure systems.
  - Added guidance that applicants need to consider safety concerns beyond those identified by the LMP process when identifying PDCs applicable to their design.

# ARCAP Roadmap Comments

- Added guidance that applicants are responsible for identifying needed programs beyond those specified in Section 8.
- Transferred several items (e.g., consideration of LWR GSIs) from DG-1404 to the Roadmap, since they are not part of the LMP process.
- ACRS and other changes
  - In response to ACRS comments
    - Clarified language to eliminate introduction of an undefined term
    - Added a discussion in the financial qualification section regarding decommissioning cost estimates
  - Clarified that the Commission, in response to a request from the applicant, could issue a rule of particular applicability or a case-specific order
    - Expanded discussion on rule of particular applicability
      - Previous mention in Appendix A (preapplication discussion) and brief mention in Appendix B (applicability of regulations) has been expanded
        - Changes include reference to potential for rule of applicability when dealing with 10 CFR 50.2 definition of safety related and basic component
      - See Enclosure 2 to SECY 30-0093 ([ML20254A366](#))



# ARCAP Roadmap Comments

- ACRS and other changes
  - Added numbering scheme to base document for ease of reference to various guidance sections

# ARCAP Roadmap Comments

Requested changes not incorporated:

- Add a statement that consensus Codes and Standards have more weight and take precedence over regulations.
- Eliminate the design detail required in the SAR. Only identify the hazards for which design measures have been implemented.
- Delete Chapter 11, “Organization and Human-System Considerations”. Commenter indicated that “The relationship with safety is tenuous.”
- Extend the applicability of the documents to LWRs. (NOTE: expanding the applicability to LWRs is under consideration as a future action. The current limitation to non-LWRs is for consistency with NEI 18-04 and 21-07, who’s scope is non-LWRs.)

# Advanced Reactor Content of Application Project Chapter 2 “Site Information” Overview and Discussion of Comments

## Chapter 2 Overview

- Chapter 2 provides guidance on the scope and approach for selecting the external hazards which must be considered in the plant design.
- The selection of external hazards is to be informed by a probabilistic external hazards analysis, when supported by available methods, data, standards and guides.
- Chapter 2 limits the amount of information that needs to be provided in the SAR to that necessary to establish the design basis external hazards.
- Chapter 2 refers to existing site evaluation guidance (e.g., RGs) where appropriate.
- The guidance in Chapter 2 is based upon the requirements of 10 CFR Part 100, Subpart B.
- 12 comments received.

## Chapter 2 Comments

- Changes made because of comments:
  - Revised the frequency of occurrence of nearby industrial, transportation and military facility hazards to be considered in the design to be consistent with existing guidance.
  - Allow the use of a combination of probabilistic and deterministic methods to select external hazards.
  - Eliminated the need to submit comparative information on slope stability.
  
- Requested changes not incorporated:
  - Development of a standardized process for screening out external hazards

# Advanced Reactor Content of Application Project Chapter 9 – Control of Effluents, Plant Contamination and Solid Waste

## Overview and Discussion of Comments

## Chapter 9 Overview

- Applies a performance-based approach for level of detail of information provided in the SAR related to control of routine plant radioactive effluents, plant contamination and solid waste

## Chapter 9 Comments

### Changes made because of comments:

- Clarified application content for design certifications, manufacturing licenses, and standard design approvals
- Clarified what design information is necessary when an applicant requests an exemption to 10 CFR 50.34 content requirements

### Requested changes not incorporated:

- Delete guidance the commenter interpreted as related to draft Part 53
- Delete guidance directing applicants to provide a summary of estimated doses  
Remove prescriptiveness; only reference industry standards
- Remove references to NEI template documents not previously formally endorsed but previously approved via safety evaluation



# Advanced Reactor Content of Application Project Chapter 10 – Occupational Dose Overview and Discussion of Comments

## Chapter 10 Overview

- Applies a performance-based approach for level of detail of information provided in the SAR regarding the control of occupational dose

# Chapter 10 Comments

Changes made because of comments:

- None

Requested changes not incorporated:

- None, but staff disagreed with a comment statement that the program to control occupational exposure does not extend ALARA into the design
- [comment resolution table chapter 10 - ML23277A151](#)
- [generic template NEI 07-08A ensuring occupational doses remain alara - ML093220178](#)

*Describe important equipment and facility design features that satisfy the design-specific PDC necessary to control occupational exposure, including ensuring occupational radiation exposures are ALARA, such as shielding, ventilation, area radiation and airborne radioactivity monitoring instrumentation, and dose assessment for expected occupancy*

# Advanced Reactor Content of Application Project Chapter 11 Organization and Human Systems Interaction Overview and Discussion of Comments

## Chapter 11 Overview

- Supports Part 50 and 52 non-LWR applications with relatively traditional concept of operations
  - Does not address remote or autonomous operations
- Guidance to applicants and NRC reviewers on:
  - Organizational staffing
  - Qualifications
  - Training
  - Operator Licensing: staffing exemptions, licensing during plant construction (i.e., cold licensing), considerations for new programs, other exemptions
- NRC staff also incorporated human factors engineering (HFE) guidance to supplement LMP and TICAP guidance

# Chapter 11 Comments

## Changes made because of comments:

- Added references to existing guidance covering level of detail for organizations and procedures (SRP Sections 13.1.1, 13.1.2–13.1.3, 13.5.1.1, and 13.5.2.1)
- Added applicable regulations in the acceptance criteria section
- Clarified acceptance criteria for addressing numbers of licensed and non-licensed operators; added reference to 10 CFR 26.205(c)

## Requested changes not incorporated:

- Delete entire ISG or major sections; rely on NEI 18-04, "Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development"
- Delete guidance related to topics the commenter interpreted as (draft) Part 53 requirements
- Add references to 10 CFR 50.34 (post-TMI requirements) topics
- Add clarification on technology neutral approaches for a site to meet the requirement for engineering expertise

# Advanced Reactor Content of Application Project Chapter 12 – Post Construction Inspection Testing and Analysis Program Overview and Discussion of Comments

# Chapter 12 Overview

- Intended to provide guidance to the NRC staff regarding application content that would support making the finding that the constructed plant has met the applicable Part 50 and Part 52 regulations to support issuance of an operating license or authorization to load fuel, respectively
- ISG differentiates between 10 CFR Part 52 applicants that must include inspections, tests, analyses and acceptance criteria (ITAAC) and 10 CFR Part 50 applications that are not required to include ITAAC.
- Requirements to describe preoperational testing and initial operations in OL and COL applications are contained in 50.34(b)(6)(iii) and 52.79(a)(28), respectively.
- Provides guidance for:
  - post-manufacturing and construction inspection, preoperational testing (i.e., tests conducted following construction and construction-related testing, but prior to initial fuel load), analysis verification, and
  - initial startup testing (i.e., tests conducted during and after initial fuel load, up to and including initial power ascension).



## Chapter 12 Comments

### Changes made because of comments:

- Changed “post-construction.....” text to “post-manufacturing and construction” or just “post-manufacturing” if applicable
- Clarified content requirements for MLs and COLs referencing MLs
- Clarified text regarding pre-operational testing under a CP
- Removed specific reference to test review committee

### Requested changes not incorporated:

- Add additional information regarding what ISG sections apply to CPs
- Remove acceptance criteria that the commenter interpreted to go beyond 10 CFR Part 50

# Advanced Reactor Content of Application Project Inservice Inspection/Inservice Testing Overview and Discussion of Comments

# ARCAP ISI/IST Overview

- The ISG provides guidance for developing risk-informed, performance-based ISI/IST programs for non-LWRs.
- The ISG guidance is based upon the use of a plant-specific PRA to identify the SSCs to be included in the programs.
- The ISI guidance is based upon the use of:
  - ASME BPV Code, Section XI, Division 2, “Requirements for Reliability and Integrity Management (RIM) Programs for NPPs,” for developing the ISI program using risk information and an expert panel.
  - ASME BPV Code, Section III, Division 5, “High Temperature Reactors,” for designs using high temperature materials and notes that ASME is developing a flaw evaluation Code Case for high temperature materials.

## ARCAP ISI/IST Overview (continued)

- The IST guidance is based upon:
  - Existing IST program approach, with additional guidance for passive components, and notes that ASME is developing a new OM-2 Code for inservice testing of components in new and advanced reactors, including non-LWRs.
  - Using plant-specific risk information to determine the scope of the IST program and proposed testing frequencies.
- 43 comments received.

# ARCAP ISI/IST Comments

Changes made because of comments:

- Allow the use of NQA-1 when implementing ASME BPV Code, Section XI, Division 2.
- Allow the use of unissued consensus codes at the CP stage provided they are officially issued prior to submitting the OL application and provided design finality is not being requested on any portion of the design affected by the unissued codes.
- Allow applicants for multi-module plants to apply standard ISI and IST programs to each module, without separate program approvals, provided the modules are identical.

# ARCAP ISI/IST Comments

Changes made because of ACRS comments:

- Added discussion in “use of risk information” section regarding expectations to adapt ISI/IST program as operating experience is gained
- Expanded the discussion in the “components that control fluid without mechanically interacting with the fluid,” section to encourage preapplication interactions for designs that could include such components
- Added appropriate references to the reference section.

# ARCAP ISI/IST Comments

Requested changes not incorporated:

- Eliminate the discussion of the process to be followed when the ISI program identifies degradation has occurred, because ASME BPV Code, Section XI, Division 2, provides guidance in this area.
- Delete the discussion in the IST section on passive components.
- Include graphite and ceramic composite materials in the scope of ISI, because these materials are included in ASME BPV Code, Section III, Division 5.

NOTE: The ISG does not preclude the inclusion of these materials because ASME BPV Code, Section III, Division 5, is to be used in the development of ISI for high temperature materials.

# Advanced Reactor Content of Application Project Technical Specifications

## Overview and Discussion of Comments



# ARCAP Technical Specifications - Overview

- The text in the 10 CFR 50.36 regulations for TS content needs adaptation to correlate to the analysis and outputs of the risk-informed LMP approach described in NEI 18-04.
- Guidance addresses content for TS administrative controls section and recommended TS format

# ARCAP Technical Specifications Comments

## Changes made because of comments:

- Added reference to NEI 18-04 section that addresses risk metrics for use in developing LCO completion times
- Added guidance for technical specification information in PSARs
- Added guidance regarding the need for an exemption to 10 CFR 50.36 LCO criteria

## Requested changes not incorporated:

- Revise RG 1.177 to align with NEI 18-04 risk metrics
- Revise 10 CFR 50.36 to include criteria for non-LWRs

# Advanced Reactor Content of Application Project Fire Protection for Operations Overview and Discussion of Comments

# ARCAP Fire Protection for Operations- Overview

- 10 CFR 50.48(a) requires that each operating nuclear power plant have a fire protection plan that meets the requirements of either 10 CFR Part 50, Appendix A, Criterion 3 for LWRs or the applicant's proposed principal design criteria that have been deemed acceptable by the NRC.
  - Although 10 CFR 50.48(c) – NFPA 805 – does not apply to non-LWRs, concepts associated with this risk-informed approach are included in the draft ISG
- The scope of this ISG addresses the review of the application content regarding the fire protection program for operations including application descriptions of:
  - Management policy and program direction and the responsibilities of those individuals responsible for the program/plan's implementation.
  - The integrated combination of procedures and personnel that will implement fire protection program activities.

# ARCAP Fire Protection for Operations- Overview

Change made because of ACRS comment:

- Clarified that preapplication interactions are encouraged and should not be perceived as mandatory
- Added guidance related to designs that may not rely on onsite fire brigades



# ARCAP Fire Protection for Operations Comments

Changes made because of comments:

- None

Requested changes not incorporated:

- Add reference to NEI 21-07
- Remove statements that the commenter interpreted to be from draft Part 53 (planned) requirements
- Remove references to general design criteria
- Remove prescriptive guidance regarding fire protection program
- Delete clarifying text regarding acceptability of NFPA 805
- Clarify relationship between PDC 3 and RG 1.232
- Delete reference to RG 1.189
- Remove/relax guidance regarding fire brigades for advanced reactors
- Delete references to verification and validation (V&V) of fire models
- Delete acceptance criteria and replace with only commitments to codes and standards
- Add expectations for fire protection programs in CP applications
- Add endorsement of NFPA 804
- Remove references to the term Authority Having Jurisdiction (AHJ)
- Remove/revise criteria in the guidance that may not apply to SMRs
- Remove references to a monitoring program for a non-NFPA 805 plant

## Next Steps

- NRC staff's near-term focus is that the ARCAP and TICAP guidance to support near term 10 CFR Part 50 and 52 non-light water reactor applications
- Longer term, the NRC staff will update the guidance as appropriate to support the 10 CFR Part 53 rulemaking effort

# Acronyms and Initialisms

ADAMS	Agencywide Documents Access and Management System	CP	construction permit	FSAR	final safety analysis report
ANS	American Nuclear Society	DBA	design-basis accident	GSI	generic safety issue
AOO	abnormal operating occurrence	DBE	design-basis event	HFE	human factors engineering
ASME	American Society of Mechanical Engineers	DBEHL	design-basis event hazard level (NEI 18-04)	ISG	interim staff guidance
ARCAP	Advanced Reactor Content of Applications	DBHL	design-basis hazard level (NEI 21-07)	ISI	inservice inspection
ARCOP	Advanced Reactor Construction Oversight Process	DC	design certification	ISG	inservice testing
BDBE	beyond design-basis event	DG	draft regulatory guide	ITAAC	inspections, tests, analyses and acceptance criteria
CDC	complementary design criteria	DID	defense in depth	LBE	licensing basis event
CFR	Code of Federal Regulations	EAB	exclusion area boundary	LCO	limiting condition for operation
COL	combined license	FOAK	first-of-a-kind	LMP	Licensing Modernization Project
		FR	Federal Register	LPSD	low-power and shutdown



## Acronyms and Initialisms (continued)

ML	manufacturing license	PDC	principal design criteria	SRM	staff requirements memorandum
NEI	Nuclear Energy Institute	POS	plant operating state	SSC	structure, system, and component
NEIMA	Nuclear Energy Innovation and Modernization Act	PRA	probabilistic risk assessment	TEDE	total effective dose equivalent
NFPA	National Fire Protection Association	PSAR	preliminary safety analysis report	TICAP	Technology-Inclusive Content of Applications
NLWR	non-light-water reactor	RFDC	required functional design criteria	TIRICE	Technology-Inclusive, Risk Informed Change Evaluation
NPUF	non-power utilization facility	RG	regulatory guide	TIMaSC	Technology-Inclusive Management of Safety Case
NSRST	non-safety-related special treatment	RSF	required safety function	TS	Technical Specification
NST	no special treatment	SAR	safety analysis report		
OL	operating license	SDA	standard design approval		
		SE	supplemental evaluation		
		SR	safety related		