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

Technology Inclusive Content of Application Project Workshop

May 26, 2021
Microsoft Teams Meeting
Bridgeline: 301-576-2978
Conference ID: 389 389 221#

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

Agenda

Time	Topic*	Speaker
10:00 - 10:15 am	Opening Remarks	NRC/Southern
10:15 - 12:00 am	First Workshop Session Topics. The topic# is based on the list of topics found in a document available in ADAMS at Accession No. ML21120A057 Topic #17 - Definition of Licensing Basis Topic #18 - Proposed FSAR Chapter 1 – not licensing basis info Topic #3b, 10, 12 - Defense in Depth	NRC/Southern
12:00 - 1:00 pm	Break	All
1:00 -2:45 pm	Second Workshop Session Topics Topic #9 - Reliability and Other Targets Topic #6 - Principal Design Criteria (PDC)	NRC/Southern
2:45 - 3:30 pm	BREAK	All
3:30 - 5:15 pm	Third Workshop Session Topics Topic #7 - 10 CFR 50.43(e) Testing Topic #22 – Additional topics from eVinci and MCRE Tabletop Exercises Topic #20 – TICAP RG and ARCAP ISG	NRC/Southern
5:15 - 5:30 pm	Plans for Future Discussions	NRC/Southern
5:30 - 6:00 pm	Stakeholder Comments/Questions	All

***Note that the list of topics to be discussed during the allotted time slot is subject to change. Additional detail regarding the list of topics can be found at ADAMS Accession No. ML21120A057**

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TICAP Workshop

- The purpose of this workshop is to discuss with the nuclear industry issues related to the draft guidance document for Safety Analysis Report (SAR) content for an advanced reactor application based on the licensing modernization project
- Key documents associated with the workshop are referenced in the meeting notice and include:
  - Industry-developed draft TICAP guidance document (ADAMS Accession No. ML21106A013)
  - Potential Issues to be Discussed During TICAP Workshops (ADAMS Accession No. ML21120A057)
    - As updated by May 11, 2021, Meeting Summary Enclosure 2 (ADAMS Accession No. ML21132A295)
- Additional Background Available on NRC ARCAP/TICAP public webpage (see: https://www.nrc.gov/reactors/new-reactors/advanced/details.html#advRxContentAppProj)

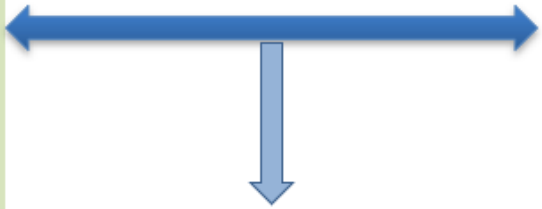
ARCAP and TICAP – **Nexus**

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

1. General Plant Information, Site Description, and Overview of the Safety Case
2. Generic Analyses
3. Licensing Basis Event (LBE) Analysis
4. Integrated Plant Analysis
5. Safety Functions, Design Criteria, and SSC Categorization
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
12. Initial Startup Programs



Audit/inspection of Applicant Records

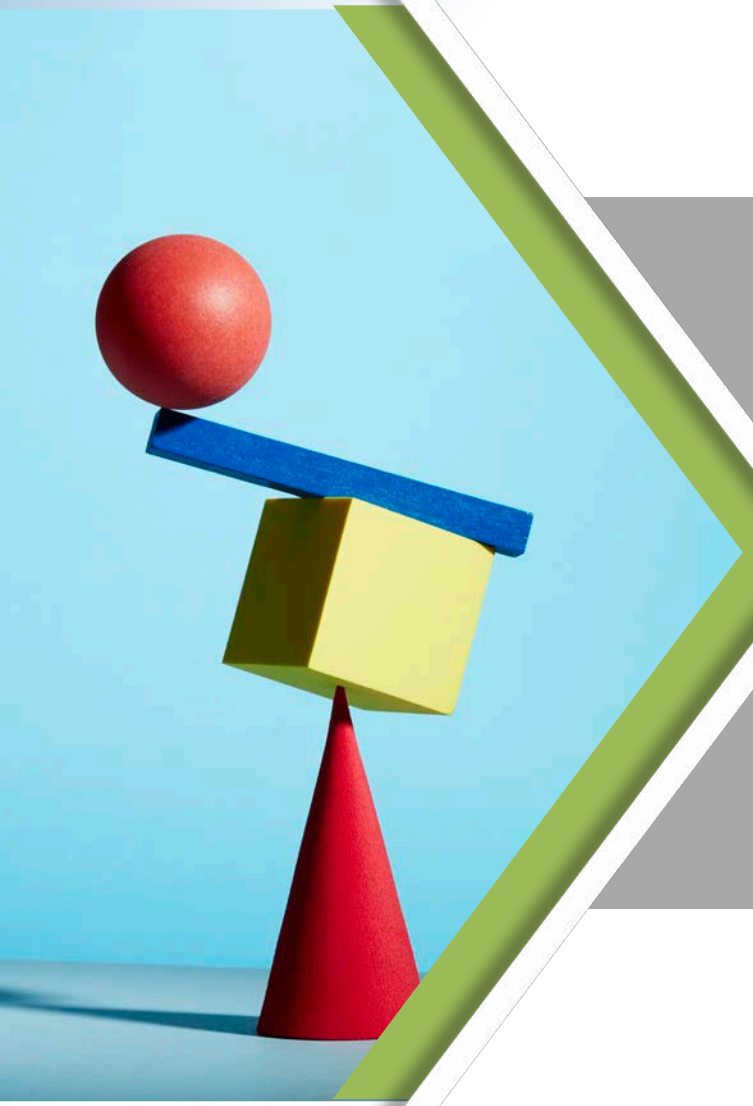
- Calculations
- Analyses
- P&IDs
- System Descriptions
- Design Drawings
- Design Specs
- Procurement Specs

Additional Portions of Application

- Technical Specifications
- Technical Requirements Manual
- Quality Assurance Plan (design)
- Fire Protection Program (design)
- PRA
- Quality Assurance Plan (construction and operations)
- Emergency Plan
- Physical Security Plan
- SNM physical protection program
- SNM material control and accounting plan
- Cyber Security Plan
- Fire Protection Program (operational)
- Radiation Protection Program
- Offsite Dose Calculation Manual
- Inservice inspection/Inservice testing (ISI/IST) Program
- Environmental Report
- Site Redress Plan
- Exemptions, Departures, and Variances
- Facility Safety Program (under consideration for Part 53 applications)

- Safety Analysis Report (SAR) structure based on clean sheet approach

*Additional contents of application outside of SAR are still under discussion. The above list is draft and for illustration purposes only.



Advanced Reactors

Overview of ARCAP Roadmap ISG and TICAP DG White Papers

ADAMS Accession No. ML21134A164

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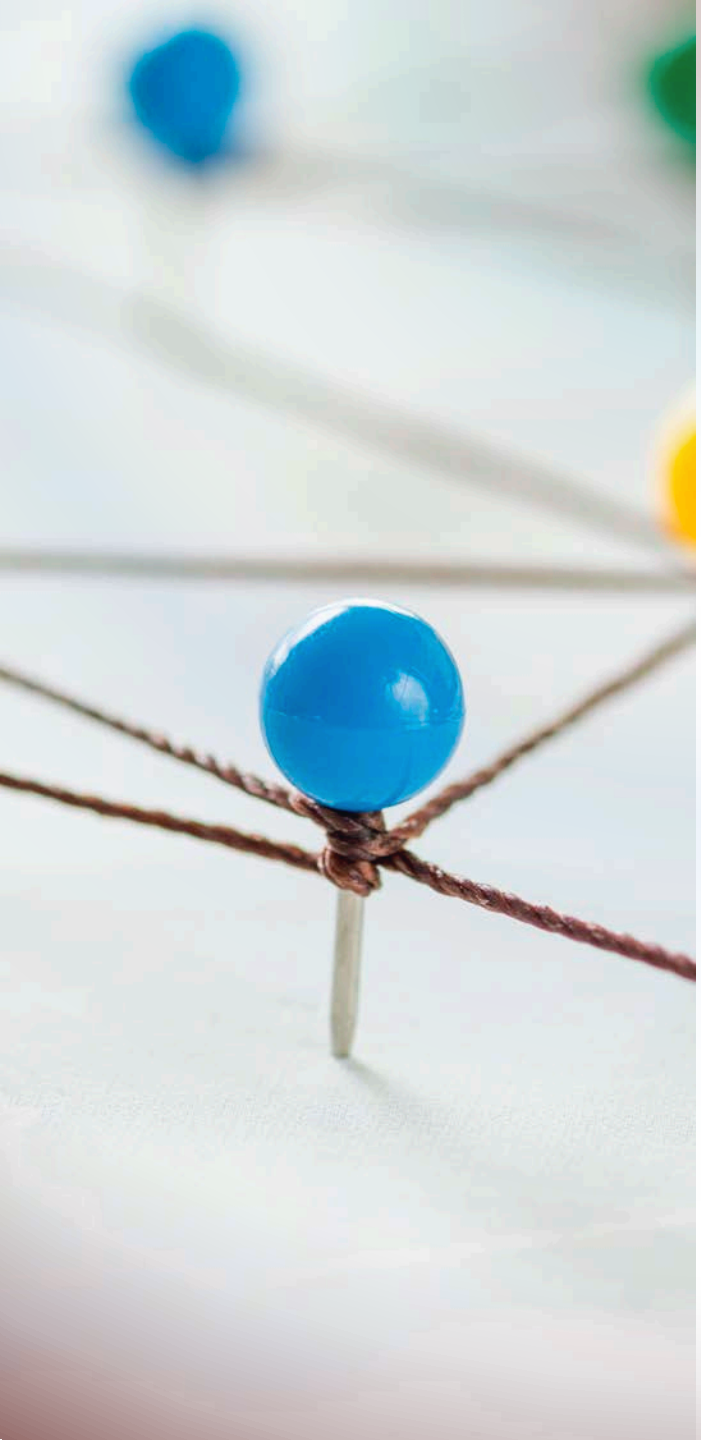
Advanced Reactor Content of Application (ARCAP)

To ensure review readiness to regulate a new generation of advanced reactors, a key element of a flexible regulatory framework is to provide guidance for the development of content of an advanced reactor application.

- Ensures consistency of staff reviews,
- Presents a well-defined base for scope and requirements of reviews.

- Makes information about regulatory matters widely available,
- Improves communication and understanding of the staff review process by interested members of the public and the nuclear power industry.

- Apply lessons learned from LWR application reviews
- Technology Inclusive
- Risk-Informed Performance-Based



ARCAP

Background

Purpose
Provides a roadmap for developing a tech-inclusive, risk-informed application. Leverages existing guidance or guidance that is under development.

Broad
Encompasses industry-led technology-inclusive content of application project (TICAP).

Need for Additional Guidance
Roadmap also identifies areas where additional guidance is needed (i.e.: Technical Specifications).

Regulatory Applicability (As applicable)
10 CFR Parts 50, 52, and informs 53.

Streamlined Review Process
ARCAP guidance document not intended to replicate NUREG-0800, "Standard Review Plan for LWRs."

Previous Discussions
ARCAP overview discussed at August 2020, October 2020, and February 2021 public meetings.

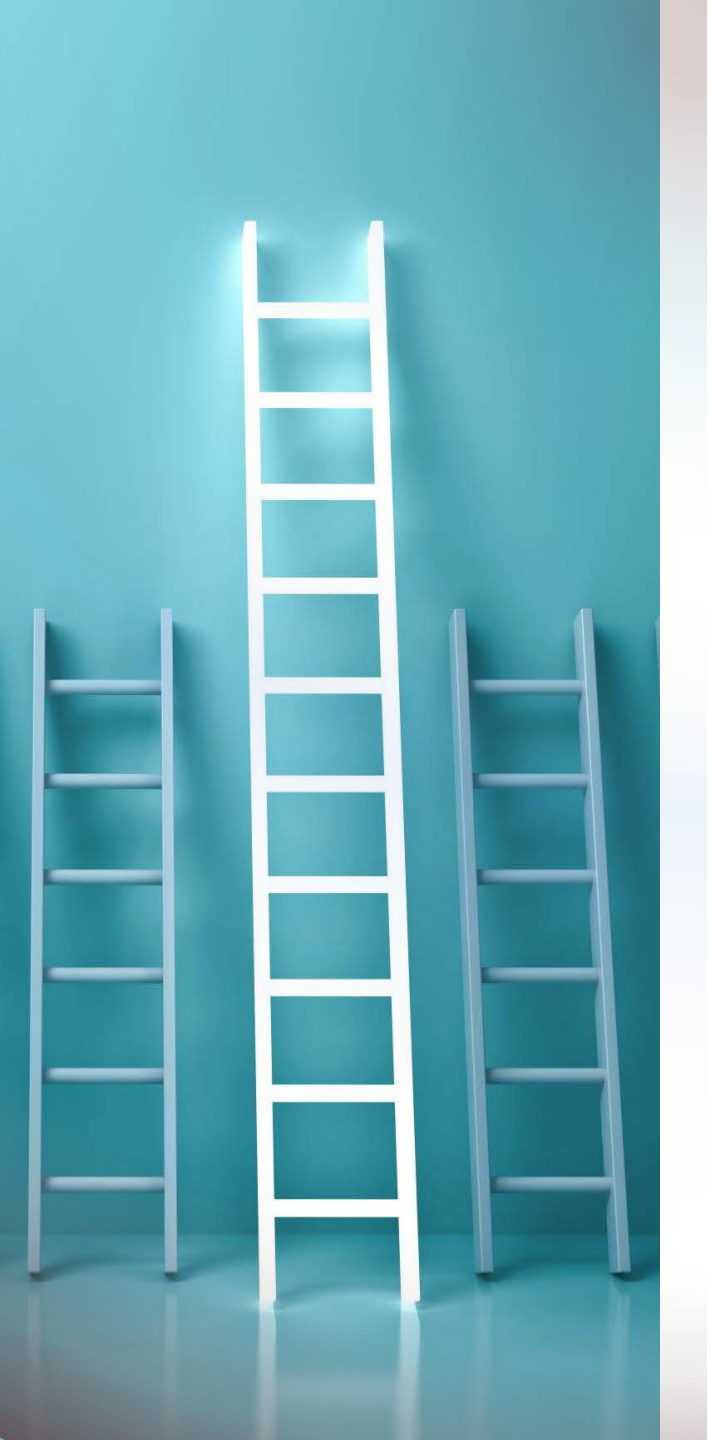
ARCAP Roadmap ISG – **Outline**

Identifies all Adv. Rx application topics.

Provides background and overview of expected information for each topic.

Provides endorsements, clarifications, supplements info, or points of emphasis.

Provides pointers to key guidance in support of application topic.



TICAP

Background

Purpose

- TICAP is industry-led guidance focused on describing the scope and level of detail for portions of an application consistent with the LMP.
- LMP is described in NEI18-04, as endorsed by RG 1.233
- Industry-led TICAP guidance only applicable to portions of first 8 SAR chapters.
- Aims to minimize burden of generating and supplying non-safety significant information.

Regulatory Applicability (As applicable)

10 CFR Parts 50, 52, and informs 53

Methodology

Scope is governed by the LMP-based safety case. LMP process is one approach to select licensing basis events, develop SSC categorization and ensures defense-in-depth is considered

TICAP draft DG– **Outline**

Endorses LMP-based NEI 21-xx TICAP document.

Provides additional clarifications, exceptions, points of emphasis from information described in NEI 21-xx.

Provides further information needed outside of LMP-based affirmative safety case for first 8 chapters.

Includes appendices to key guidance in support of FSAR development for first 8 chapters.

ARCAP and TICAP – **Nexus**

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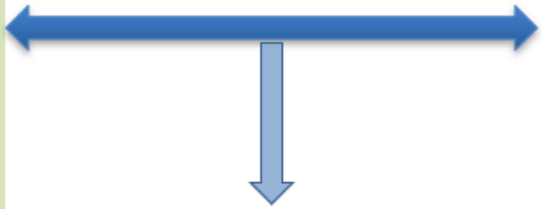

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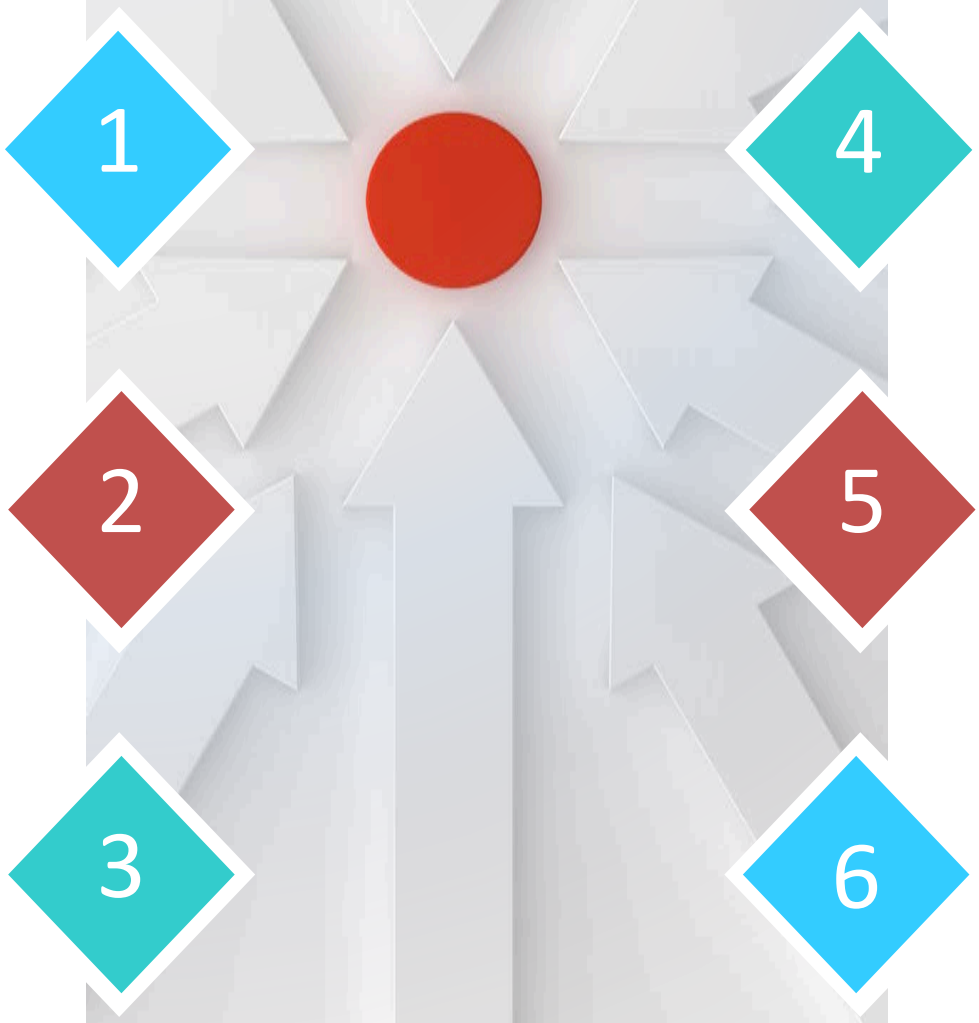
NRC ARCAP/TICAP Guidance

Other Insights



Efficiency
NRC ARCAP/TICAP guidance being developed in parallel to industry,

Openness
Main purpose of releasing draft documents is to solicit stakeholder feedback on proposal,

Initial Thoughts
The guidance structure, not detailed content, is the focus of stakeholder interactions,

Adaptable
ARCAP guidance includes placeholders for guidance under development (i.e.: Pre-app engagement, Applicability of Regs),

Endorsement
NRC TICAP white paper endorses, as appropriate, industry's TICAP document,

Supplements
NRC TICAP white paper supplements, as appropriate, information not addressed in industry's TICAP document (i.e.: Fuel Qual and ASME Sec III, Div 5).

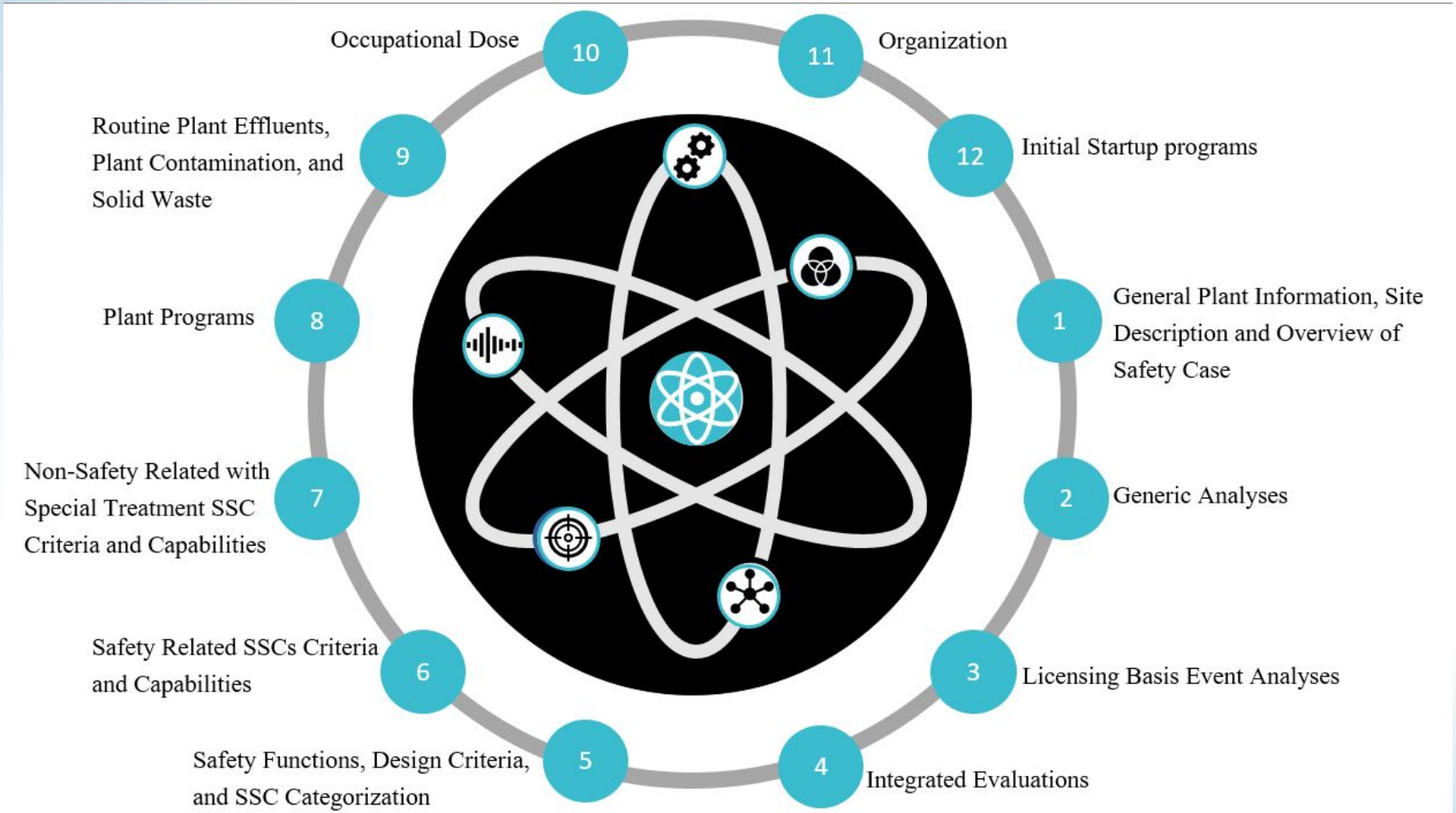
ARCAP Roadmap ISG – **Example 1**

- FSAR structure developed as a result of extensive stakeholder engagement.
- Consists of 12 main chapters.
- Provides the most safety-significant information at the forefront (ASC).
- Focus on the most relevant safety information while removing unnecessary details.
- Additional information/background is available for audit/inspection by NRC.

Contents of an Advanced Reactor Application*

- Safety Analysis Report
- Technical Specifications
- Technical Requirements Manual
- Quality Assurance Plan (Design, Construction, and Operation)
- Fire Protection Program (Design and Operation)
- Probabilistic Risk Assessment
- Environmental Report/Redress Plan
- Emergency Plan
- Physical Security Plan
- Radiation Protection Program
- Offsite Dose Calculation Manual
- Special Nuclear MC&A
- ITAAC
- Cyber Security Plan
- ISI/IST
- Financial Qualification/Liability
- Facility Safety Program

*Contents of application are still under discussion. List represents a draft outline



Note: SAR Chapters 1-8 addressed by TICAP. SAR Chapters 9-12 addressed by ARCAP.

Ch. 1- General Plant Information, site description, and overview of safety case (TICAP)

Information should provide an understanding of the overall facility (type of application, the number of plant units, a brief description of the proposed plant location, and the type of advanced reactor being proposed). The site description should provide an overview of the actual physical, environmental and demographic features of a site, and how they relate to the affirmative safety case.

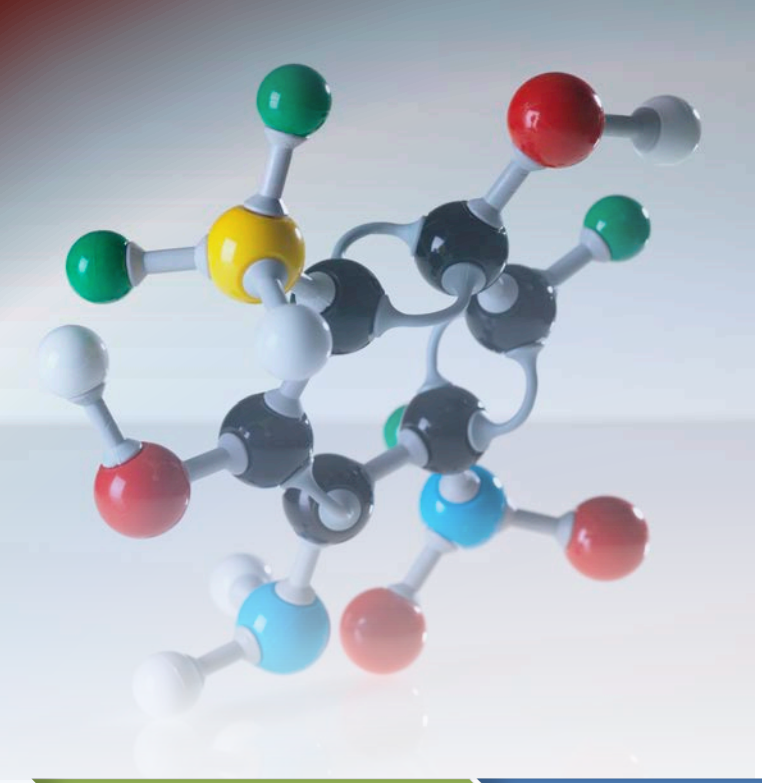
Clarifies	Endorses	Key Guidance	Supplements
• Roadmap clarifies that guidance applicable to chapter 1 is described in NEI 21-xx – TICAP document.	• RG 1.2xx "Guidance For A Technology-inclusive Content Of Application Methodology To Inform The Licensing Basis And Content Of Applications For Licenses, Certifications, And Approvals For Advanced Reactors."	• Chapter 1 of NEI 21-xx (TICAP) as one acceptable method.	• Construction Permit Information in NEI 21-xx by including Appendix A for info outside LMP for first 8 chapters.*

Note: CP information for all other portions of the application are described in Appendix E of the ARCAP roadmap ISG)

Ch. 2- Generic Analyses (TICAP)

Certain analyses are common to several licensing-basis event analyses. Information should describe the process and methods used to develop baseline information related to the probabilistic risk assessment (overview of the PRA), source-term analysis, and design-basis accidents (DBAs) analytical methods.

Clarifies	Endorses	Key Guidance	Supplements
• Roadmap clarifies that guidance applicable to chapter 2 is described in NEI 21-xx – TICAP document.	• RG 1.2xx "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."	• Chapter 2 of NEI 21-xx (TICAP) as one acceptable method.	• "Site Information" draft ISG previously released. • Staff positions on additional considerations to document information.



Ch. 10 – Control of Occupational Dose

Information should include facility and equipment design, radiation sources, and operational programs that are necessary to ensure that the occupational radiation protection standards set forth in 10 CFR Part 20 are met. The information should also include any commitments made by the applicant to develop the management policy and organizational structure necessary to ensure occupational radiation exposures are as low as (is) reasonably achievable (ALARA).

Clarifies

- Guidance is included for chapters 9-12.

Endorses

- DANU-ISG-2021-XX, "Control of Occupational Dose."
- Released on prior ARCAP/TICAP public meeting.

Key Guidance

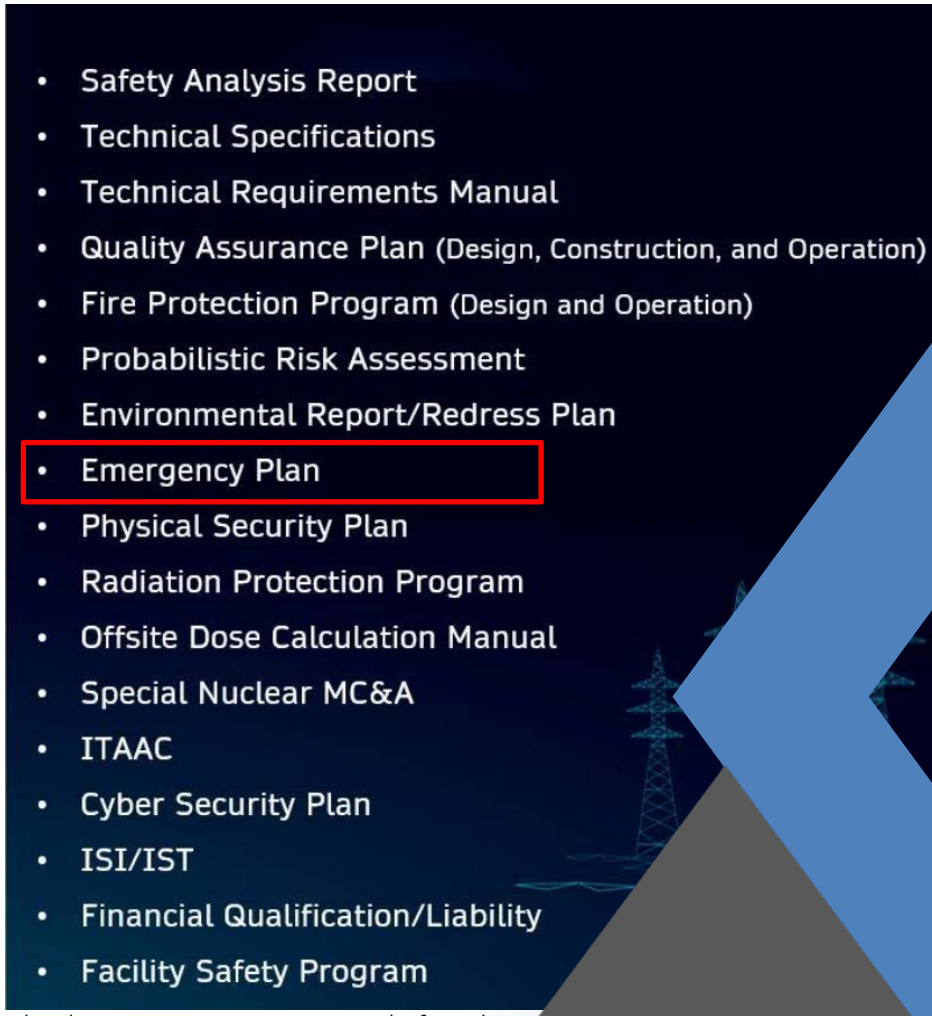
- RG 8.8
- RG 8.10
- ANSI/ANS 18.1-1999
- NEI 07-08A
- Draft list released in prior public meeting. Expected to evolve. (MLxyz123).

Supplements

ARCAP Roadmap ISG – **Example 2**

- Ongoing "Emergency Preparedness Requirements for Small Modular Reactors and Other New Technologies" rulemaking.
- Rule would amend the NRC's regulations to add new emergency preparedness requirements for small modular reactors, non-light-water reactors and non-power production or utilization facilities.
- Rule would adopt a scalable plume exposure pathway emergency planning zone approach that is performance-based, consequence-oriented, and technology-inclusive.

Contents of an Advanced Reactor Application*



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Emergency Preparedness Plan

This rulemaking would develop a dose-based, consequence-oriented framework for future SMR applicants and licensees with respect to offsite EP that would reduce the need for exemptions related to regulations associated with large LWRs.
- SECY-16-0069 (ML21007A330)

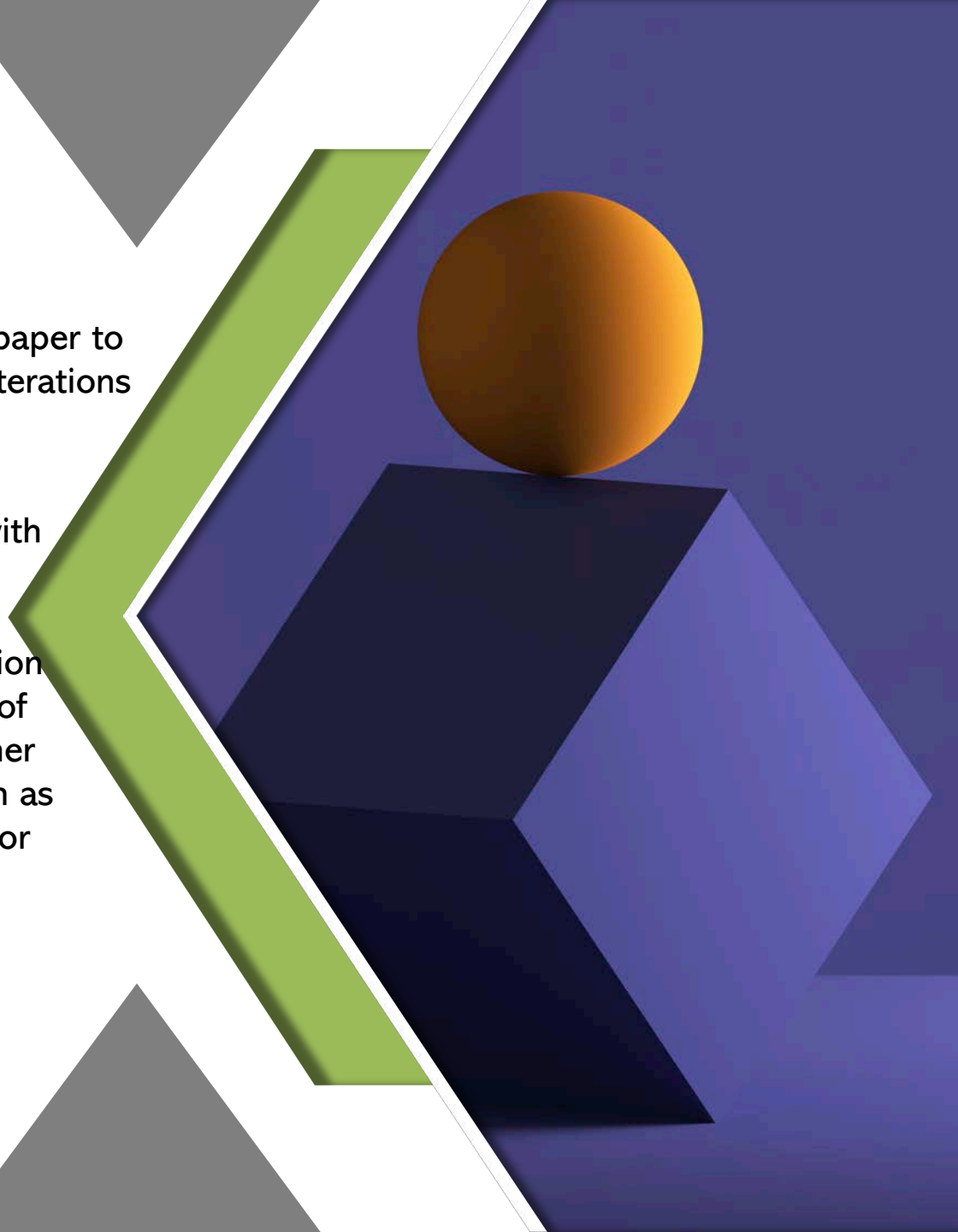
Clarifies	Endorses	Key Guidance	Supplements
• Ongoing rulemaking.		• DG-1357, "Emergency Response Planning and Preparedness for Nuclear Power Reactors." • SECY-18-0103	

Key Messages
What's Next?

- Draft roadmap ISG released as white-paper to solicit stakeholder feedback. Further iterations expected.

- Some sections are primarily aligned with the Licensing Modernization Project (LMP), however:
  - the concepts and general information may be used to inform the review of an application submitted using other methodologies (as applicable) such as a maximum hypothetical accident, or deterministic approaches.

- Draft ISG expected to be released Fall 2021.



Next Steps – Future Milestones

TICAP Near-Term Milestones
Early June 2021 (NRC staff comments on draft guidance document provided to industry)
Late July 2021 (Industry revised guidance provided to the NRC)