



Technology Inclusive Content of Application Project (TICAP) Public Meeting

January 18, 2022
Microsoft Teams Meeting
Bridgeline: 301-576-2978
Conference ID: 580 886 714#

Agenda

Time	Topic	Speaker
10:00 – 10:10 am	Opening Remarks	NRC/Industry
10:10 – 11:10 am	Discussion of TICAP* guidance related to Principal Design Criteria	Industry
11:10 – 11:40 am	Discussion of TICAP guidance related to safety analysis report content for anticipated operational occurrences, design-basis events, and beyond-design-basis events	NRC/Industry
11:40 – 12:00 pm	Stakeholder Questions	All
12:00 – 1:00 pm	Break	All
1:00 – 2:30 pm	Discussion of preliminary exceptions, clarifications and additions	NRC/Industry
2:30 – 2:45 pm	Stakeholder Questions	All
2:45 – 3:00 pm	Break (if needed)	All
3:00 – 3:50 pm	Continuation of discussion on TICAP guidance including staff proposed changes to address industry comments	NRC/Industry
3:50 – 4:00 pm	Next Steps and Closing Remarks	NRC/Industry

***Note that Industry's TICAP guidance document Revision 0-B is available at:**

<https://www.nrc.gov/docs/ML2134/ML21343A292.pdf>

TICAP Public Meeting

- Purpose: to discuss draft guidance for advanced reactor application safety analysis reports (SARs) using Nuclear Energy Institute (NEI) 18-04's Licensing Modernization Project (LMP)
- Key documents:
 - NEI 21-07, Revision 0-B, "Technology Inclusive Guidance for Non-Light Water Reactors; Safety Analysis Report Content for Applicants Using the NEI 18-04 Methodology" ([ML21343A292](#))
 - NRC staff feedback on level of detail in the safety analysis report (SAR) for anticipated operational occurrences (AOOs), design-basis events (DBEs), beyond-design-basis events (BDBEs) with radiological consequences ([ML22012A274](#))
 - NRC preliminary exceptions, clarifications, and additions (ML22013B183)
 - Additional background available on the NRC Advanced Reactor Content of Application Project (ARCAP)/TICAP public webpage (see: <https://www.nrc.gov/reactors/new-reactors/advanced/details.html#advRxContentAppProj>)

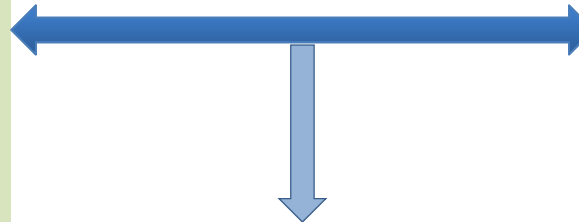
ARCAP and Technology Inclusive Content of Application Project (TICAP) - Nexus

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

1. General Plant Information, Site Description, and Overview of the Safety Case
2. Methodologies and Analyses
3. Licensing Basis Events
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
- 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.

Principal Design Criteria

Industry Slides

Technology Inclusive Content of Application Project (TICAP)

TICAP Response to NRC Position on Principal Design Criteria (PDC) approach in NEI 21-07 “Technology Inclusive Guidance for Non-Light Water Reactors”

Brandon Chisholm, Southern Company
Steve Nesbit, LMNT Consulting

NRC Public Meeting
January 18, 2022



- TICAP response to NRC position on PDC scope and changes to NEI 21-07 guidance
- Proposed TICAP PDC approach
- Response to NRC recommendations #1-3, 5 from Dec 14 meeting (ML21344A006)
- Potential Alternate TICAP PDC guidance – justification of exemption(s)
- Response to NRC recommendation #4 from Dec 14 meeting (ML21344A006)

Overview and Perspective



- Both the Technology Inclusive Content of Application Project (TICAP) team and the Nuclear Regulatory Commission (NRC) staff have been working to formulate acceptable approaches to specifying principal design criteria (PDC) for a risk-informed, performance-based (RIPB) license application based on NEI 18-04
- There is agreement that the regulations require the applicant to specify its PDC for the facility (e.g., 10 CFR 50.34(a)(3)(i) for a construction permit application)
- There is agreement that a non-LWR applicant's PDC are not required to meet the light water reactor general design criteria (GDC) in 10 CFR 50 Appendix A or the Advanced Reactor Design Criteria in RG 1.232

NRC Position on PDC scope (ML21344A006)



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Principal Design Criteria

Response to Question 1:

- The scope of PDC were discussed and established in regulatory history and expressed in the regulations (Introduction to 10 CFR Part 50, Appendix A) and logically leads to a conclusion that PDC are the type of information foreseen by AEA Section 182 in license applications, as follows:

The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety; that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.

- **The NRC position on the requirement for proposed PDC is that it includes the scope of PDC described in the regulations as well as in the regulatory history.**

...design, fabrication, construction, testing and performance requirements for structures, systems, and components important to safety

TICAP Response: PDC scope



- The TICAP team agrees with the NRC position that:
 - The scope of PDC under 10 CFR Part 50/52 (without an exemption) includes “the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety”
 - Although the NEI 21-07, Rev. 0 proposed SAR content:
 - » would require the information to satisfy the above scope, it is not consistent with the current scope definition of PDC and regulatory history that requires that the information be labeled explicitly as PDC
 - » would, if the safety case is based on it, include additional SSCs or programmatic elements beyond the minimum required to meet the performance objectives of regulations (i.e., Complementary Design Criteria), it does not label such additional elements as PDC
- The TICAP team will revise the approach for identifying PDC to satisfy the above description of scope

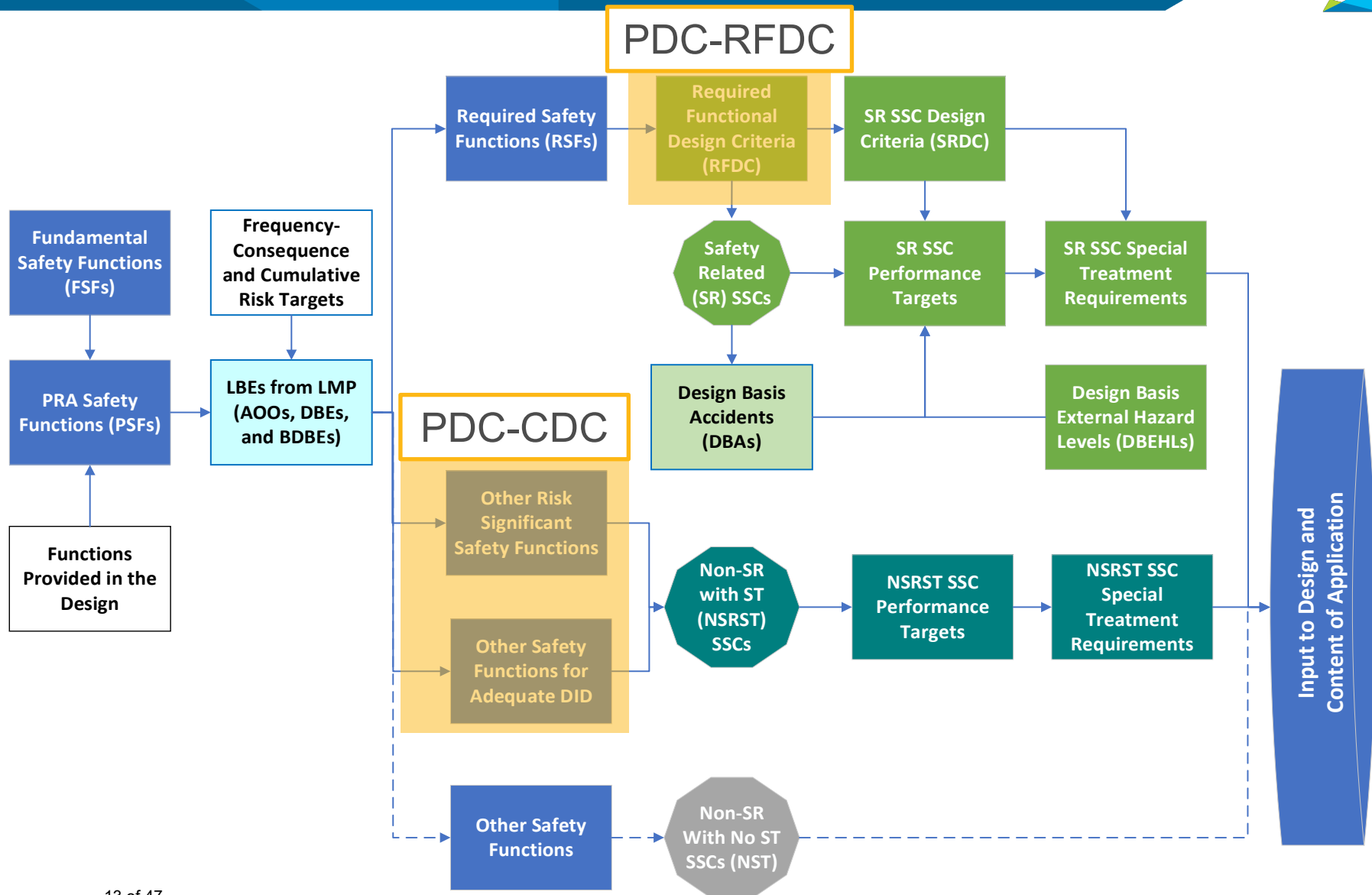
Description of Revised TICAP PDC Approach

Proposed Changes to NEI 21-07



- According to the guidance in NEI 21-07 Rev 0, the set of PDC consisted of the Required Functional Design Criteria (RFDC). This definition of scope was missing the following elements to satisfy the scope required by the regulatory history:
 - Applicable special treatments (i.e., “fabrication, construction, testing”)
 - Safety-significant functions and supporting SSCs beyond the RFDC (i.e., the Complementary Design Criteria, CDC)
- As such, NEI 21-07 will be revised to reflect an approach for developing a set of PDC that includes:
 - A graded Quality Assurance (QA) criterion that identifies the special treatments for the SSCs performing the functions comprising the PDC
 - All safety-significant functions (i.e., RFDC and CDC)

PDC include Safety-Significant Functions/SSCs



Example of Functional PDC (MHTGR)



Required Safety Function/Subfunctions	PDC-RFDC
Shutdown Reactor	VI: The equipment needed to sense, command, and execute a trip of the control rods, along with any necessary electrical power, shall be designed and operated in such a manner that reactor core shutdown is assured during off-normal conditions.
Transfer Heat to Ultimate Heat Sink	X: A highly reliable, passive means of removing the heat generated in the reactor core and radiated from the reactor vessel wall shall be provided. The system shall remove heat at a rate which limits core and vessel temperatures to acceptable levels during a loss of forced circulation.
Limit Fuel Oxidation	XII: The primary system/boundary shall be designed to ensure high reliability of the primary system/boundary integrity needed to prevent air ingress during normal and off-normal conditions. The plant shall be designed and operated in a manner that ensures that the primary system boundary design limits are not exceeded.

Handling of Special Treatments in PDC



- In addition to the functional criteria and the supporting SSCs, the PDC will include one Quality Assurance criterion (i.e., similar to GDC/ARDC 1) that addresses *design, fabrication, construction, and testing* quality standards for safety-significant (i.e., SR and NSRST) functions/SSCs
 - NEI 18-04 Section 4.4.5: “the applicability of any category of special treatment to any SSC must be evaluated on a case-by-case basis and in the context of the SSC functions in the prevention and mitigation of applicable LBEs”
 - i.e., the application will not necessarily state special treatments in every area for each and every safety-significant function/SSC, but the necessary special treatments (identified via the LMP approach) will be explicitly stated in the appropriate section of the SAR
 - Note: fabrication, construction, testing, and performance requirements are not provided for every criterion uniformly in the GDC

» “*Criterion 64 - Monitoring radioactivity releases. Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.*”

Considerations for QA PDC in TICAP



From 10 CFR Part 50, Appendix A (emphasis added):

“Criterion 1 - Quality standards and records. Structures, systems, and components **important to safety** shall be **designed, fabricated, erected, and tested to quality standards commensurate** with the **importance of the safety functions** to be performed. Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the **required safety function**. A quality assurance program shall be established and implemented in order to provide adequate assurance that these structures, systems, and components will satisfactorily perform their **safety functions**. Appropriate records of the design, fabrication, erection, and testing of **structures, systems, and components important to safety** shall be maintained by or under the control of the nuclear power unit licensee throughout the life of the unit.”

Considerations for QA PDC in TICAP



- 10 CFR 50, Appendix A: “*Structures, systems, and components **important to safety** shall be designed, fabricated, erected, and tested to quality standards commensurate with the **importance of the safety functions** to be performed.*”
- “important/importance to safety” would be replaced with “safety-significant” and/or “safety significance”

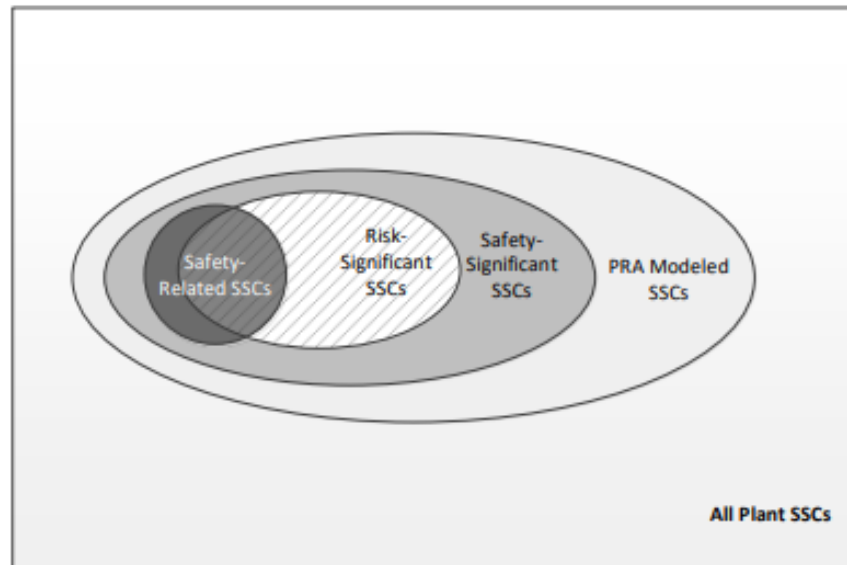


Figure 4-2. Definition of Risk-Significant and Safety-Significant SSCs

Considerations for QA PDC in TICAP



- 10 CFR 50, Appendix A: “Structures, systems, and components important to safety shall be **designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions to be performed.**”
- NEI 18-04 provides guidance on SSC treatment “commensurate with the safety-significance of the function to be performed”
 - Section 4.4.5: “This is determined by design and confirmed via an Integrated Decision Process that is part of the LMP methodology for evaluating DID adequacy.”

Table 4-1. Summary of Special Treatments for SR and NSRST SSCs

Special Treatment Category	Applicability ¹			Available Guidance ⁴
	SR SSC	NSRST SSC	NST SSC	
10 CFR 50 Appendix B Quality Assurance Program	√			QA requirements consistent with 10 CFR 50 Appendix B should be risk-informed and performance-based and not compliance-based; guidance in SRP 17.5 Quality Assurance for safety-related SSCs, 10 CFR 50.69, SRP 1.201
User provided Quality Assurance (QA) Program for non-safety SSCs		√		QA requirements consistent with SRP 17.4 (Reliability Assurance Program) for non-safety-related, safety significant SSCs should be risk-informed and performance-based and not compliance based; guidance in SRP 17.5 Quality Assurance for non-safety-related SSCs, 10 CFR 50.69, SRP 1.201

Considerations for QA PDC in TICAP



- 10 CFR 50, Appendix A: *“Where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency and shall be supplemented or modified as necessary to assure a quality product in keeping with the **required safety function**. A quality assurance program shall be established and implemented in order to provide adequate assurance that these structures, systems, and components will satisfactorily perform their **safety functions**.”*
- Under LMP, “required safety function” only pertains to SR-SSC
- “safety function” is not inclusive, since NSRST SSCs are “non-safety”
- Could replace with “safety-significance/significant” for inclusion of SR and NSRST functions/SSCs

Response to NRC Recommendations #1-3, 5

(See ML21344A006)

NRC Recommendation #1



- **NRC:** Include discussion on the affirmative safety case that recognizes that use of the LMP process by a non-LWR applicant under 10 CFR Parts 50 and 52 will inform the development of a safety case for the facility but may not address the entirety of the safety case necessary for an application for a license (e.g., normal operations, stable long-term subcriticality and cooling, etc.). Elements of the safety case not informed by the LMP process and addressed in the TICAP guidance will be addressed in the ARCAP guidance.

TICAP Response (Recommendation #1)



- **TICAP:** NEI 21-07 Rev0b specifically notes that the affirmative safety case does not address
 - normal operations, and
 - potential licensing basis events (such as subcriticality events) that applicant and regulator may decide are prudent to be added beyond the reasonable assurance of adequate protection standard.
- Additionally, TICAP will revise the guidance for SAR Chapter 5 to note that the PDC developed using the LMP and TICAP methodologies will not address the entirety of the safety case necessary for a license

NRC Recommendation #2



- **NRC:** Include a discussion on the development of proposed PDC that recognizes that use of the LMP process by a non-LWR applicant under 10 CFR Parts 50 and 52 will inform the development of proposed PDC for the facility but may not include the entirety of PDC necessary to demonstrate, and for the NRC to find, that the facility will operate so as to provide adequate protection of the health and safety of the public (e.g., normal operations, stable long-term subcriticality and cooling, etc.). Development of proposed PDC not informed by the LMP process and not addressed in the TICAP guidance will be addressed in the ARCAP guidance.

TICAP Responses (Recommendation #2)



- **TICAP:** Rather than a few examples and “etc.”, can the NRC please provide a complete list of areas that it considers to require PDC that are not covered by LMP/TICAP?
- TICAP recognizes that an affirmative safety case developed using NEI 21-07 will not cover normal operations (see response to Recommendation #1)
 - TICAP will note in the guidance for SAR Chapter 5 that the PDC developed using the LMP and TICAP methodologies will not address the entirety of the safety case necessary for a license

NRC Recommendation #3 and TICAP Response



- **NRC:** Include a discussion on the development of proposed PDC that recognizes that the GDC in 10 CFR Part 50, Appendix A, and the ARDC in RG 1.232 provide guidance on the scope of proposed PDC to be developed by a non-LWR applicant under 10 CFR Parts 50 and 52 and contain the criteria that are sufficient to support an NRC finding that there is reasonable assurance of adequate protection of the health and safety of the public (i.e., design, fabrication, construction, testing, and performance requirements for structures, systems, and components).
- **TICAP:** NEI 21-07 will be revised to reflect the NRC's position on the scope of PDC with respect to the elements that must be addressed (without an exemption)
 - Additional guidance will be added to NEI 21-07 guidance for SAR Chapter 5 regarding the development of an advanced reactor QA principal design criterion

NRC Recommendation #5



- **NRC:** Include a discussion on the development of proposed PDC and CDC by a non-LWR applicant under 10 CFR Parts 50 and 52 that certain CDC may be considered by the NRC to be equivalent to PDC if necessary to support its finding if the CDC contain the criteria that are necessary to demonstrate there is reasonable assurance of adequate protection of the health and safety of the public (i.e., design, fabrication, construction, testing, and performance requirements for structures, systems, and components). In such cases, those CDC should be recategorized as PDC and may be categorized, for example, as PDC-B in a two-group PDC construct where PDC-A address SR SSCs and PDC-B address NSRST SSCs.

TICAP Response (Recommendation #5)



- **TICAP:** The TICAP team will revise the guidance in NEI 21-07 to reflect that the set of PDC should include both the RFDC and the CDC (if the applicant does not request an exemption)
- However, the TICAP team proposes defining the two categories of PDC as “PDC-RFDC” (corresponding to the RFDC and supporting SR SSCs) and “PDC-CDC” (corresponding to the CDC and supporting NSRST SSCs)
 - This categorization has inherent consistency with the LMP approach (e.g., the meaning of RFDC is maintained)

Potential Additional TICAP PDC Guidance: Justification for Exemption(s) on PDC Scope and Response to NRC Recommendation #4

Background: Exemption for Reduced PDC Scope



- In the Dec 14 public meeting (ML21344A006), the staff opened to door to a combination of a risk-informed approach and an exemption request for applicants proposing PDC that “... do not fully address design, fabrication, construction, testing, and performance requirements”
 - Applicants would need to “... provide supporting information that justifies to the NRC how their design meets their proposed PDC and how their proposed PDC demonstrate reasonable assurance of safety.”
 - Applicants would need to ensure “... that the elements of the PDC scope not specifically included in their proposed PDC are included in their application.”

Proposed Additional TICAP PDC Guidance



- Some applicants may want to retain current TICAP PDC approach (PDC=RFDC) and obtain a partial exemption for the scope of PDC
 1. Exemption from the implicit scope requirement of PDC from 10 CFR 50 Appendix A, i.e., that PDC include “the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety”
 2. Exemption from implicit scope requirement of PDC from 10 CFR 50 Appendix A, i.e., that PDC include “the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety”

Proposed Additional TICAP PDC Guidance



1. Functions and SSCs addressed by PDC

- NEI 18-04 method systematically identifies as safety-related selected SSCs available to perform Required Safety Functions
- NEI 18-04 method systematically identifies as NSRST selected SSCs that perform risk-significant functions or functions requiring special treatment for defense-in-depth adequacy
- NEI 21-07 approach (PDC $\equiv$ RFDC) provides PDC applicable to safety-related SSCs but not to NSRST SSCs

• Justification for exemption:

- » The LMP process identifies NSRST SSCs through a systematic, risk-informed process
- » Those NSRST SSCs are documented in the Safety Analysis Report (SAR) Chapter 7, along with special treatments and reliability and capability targets
- » Therefore “... elements of the PDC scope not specifically included in their proposed PDC are included in their application”



2. “... design, fabrication, construction, testing, and performance requirements”
 - The RFDC and their supporting SSCs address “How” (=Adequate Protection; design requirements), but “How Well” (=Reasonable Assurance; fabrication, construction, testing, and, in some cases, performance requirements) is addressed elsewhere in the SAR
- Justification for exemption:
 - » The LMP process systematically identifies special treatments for safety-related and NSRST SSCs
 - » Those special treatments provide reasonable assurance the SSCs will accomplish their safety functions
 - The special treatments are documented in SAR Chapter 6 (safety-related SSCs) and Chapter 7 (NSRST SSCs)
 - Reliability and capability targets for both classes of safety-significant SSCs are also provided in SAR Chapter 6 and Chapter 7
 - » Therefore “... elements of the PDC scope not specifically included in their proposed PDC are included in their application”

NRC Recommendation #4



- **NRC:** Include a discussion on the development of proposed PDC that informs non-LWR applicants that proposed PDC that do not address the comprehensive scope of criteria that are sufficient to support an NRC finding should request an exemption from the applicable regulations (i.e., 10 CFR 50.34(a)(3), 10 CFR 52.79(a)(4), 10 CFR 52.47(a)(3), 10 CFR 52.137(a)(3), and 10 CFR 52.157(a) and provide appropriate justification for the request.

TICAP Response (Recommendation #4)



- **TICAP:** The TICAP team is amenable to this suggestion and sees it as part of the discussion to be added to NEI 21-07 to address an exemption-based approach for PDC.
 - Clarification from the NRC regarding the relationship between the use of guidance in NEI 18-04 and/or NEI 21-07 and justification for the exemption would be helpful to frame discussion of this exemption request
 - Is NRC amenable to including a generic exemption in this endorsing RG for those applicants that include the “How Well” (the “reasonable assurance” element) in specific chapters of TICAP (e.g., Chapter X and Y)?

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

- Recent Discussions
 - Issue is TICAP guidance for level of detail in the SAR for AOOs, DBEs, and BDBEs with radiological consequences
 - Detailed discussions held during following meetings:
 - October 5, 2021, public meeting (meeting summary ADAMS Accession No. [ML21301A189](#))
 - Staff provided preliminary exception and basis for exception
 - November 9, 2021, public meeting (meeting summary ADAMS Accession No. [ML21328A233](#))
 - Industry provided response to staff proposed exception
 - December 14, 2021, public meeting (meeting summary ADAMS Accession No. [ML21354A833](#))
 - Staff revised draft guidance, including additional thoughts on the issue (see attachment to Appendix B of December 2, 2021, TICAP draft RG white paper (ADAMS Accession No. [ML21336A697](#)))

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

- Current Status
 - Staff provided additional feedback in document dated January 12, 2022 (see ADAMS Accession No. [ML22012A274](#)) identifying two primary areas for further clarification:
 - 1) Feedback regarding whether there is inconsistency between the Chapter 2 and Chapter 3 guidance of NEI 21-07, Revision 0 (ADAMS Accession No. ML21250A378)
 - 2) Industry feedback relative to Chapter 3 guidance on SAR content for AOOs, DBEs, and BDBEs.

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

NEI 21-07 content consistency:

- NEI 21-07, Revision 0-B, Chapter 2 provides guidance on source term information to be included in the SAR that is generally consistent with the above position. However, Chapter 3 guidance appears to provide conflicting and inconsistent guidance, for instance:
 - *Details on the models, site characteristics, and supporting data associated with the calculation of mechanistic source terms and radiological consequences are part of the PRA [probabilistic risk assessment] documentation that is included in the plant records.*
 - *The technical adequacy of the non-DBA [design-basis accident] LBE analyses is therefore not based on the SAR documentation ...*

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

SAR Content for AOOs, DBEs, and BDBEs:

- Staff provided additional references to support position that a SAR developed using the licensing modernization project (LMP)-based approach should contain the following information for AOOs, DBEs, and BDBEs with radiological consequences:
 - *Description of the models, site characteristics, and important supporting data associated with the calculation of the mechanistic source terms and radiological consequences.*

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

SAR Content for AOOs, DBEs, and BDBEs – additional references:

- Regulatory Guide 1.203, “Transient and Accident Analysis Methods,” describes the level of documentation to allow the appraisal of the evaluation model (EM), including: EM requirements, EM methodology, code description manuals, user manual and user guidelines, scaling reports, assessment reports, and uncertainty analysis reports.
- Xe-100 TICAP Tabletop exercise report dated August 2021 (ADAMS Accession No. [ML21217A086](#))
 - Section 4.1, “Safety Analysis Details,” references RG 1.203 and notes that elements of RG 1.203 would be best placed in TICAP Chapter 2 or other licensing basis event chapters.

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

SAR content for AOOs, DBEs, and BDBEs – additional references:

- Draft proposal on how an applicant might capture important information using a topical report
 - Provides reference to mechanistic source term methodology topical report that the staff is currently reviewing
 - Similar topical report approaches with a different scope and different information could also be used
- Provides an example of key analysis assumptions that staff expects to be captured in the SAR

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

SAR content for AOOs, DBEs, and BDBEs – additional references:

- Previous example of staff comments included in an August 13, 2021, email (ADAMS Accession No. [ML21225A565](#))
- References DBE with radiological consequence SAR content found in Appendix B of draft industry TICAP guidance document
- Includes comments relative to additional SAR content:
 - Settings of protection system functions, structure, system and component (SSC) performance assumed in the analysis
 - Discussion of how Chapter 2 dose methodology would be captured in the SAR

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

SAR Content for AOOs, DBEs, and BDBEs – additional references:

- Highlights NEI 21-07 Chapter 3 guidance that includes references to key plant parameters being captured in the SAR
 - Staff expectation that this would include such items as flow rates, temperatures, pressures and trip setpoints used in AOO, DBE and BDBE evaluations

Level of Detail in the SAR for AOOs, DBEs, and BDBEs

SAR content for AOOs, DBEs, and BDBEs – additional references:

- Regulatory Guide 1.233, “Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology To Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors,” page 24 provides guidance:
 - Analysis of AOOs, DBE, and BDBEs plays an important role in defining safety functions, classifying SSCs, and assessing defense-in-depth
 - Suggests such information could be included in old SAR structure chapter 19, chapter 15, or a new chapter created to include the analysis of AOOs, DBEs, and BDBEs

NRC Draft Preliminary Exceptions, Clarifications and Additions

- Original NRC preliminary exceptions, clarifications, and additions ([ML21274A032](#)) discussed in November 9, and December 14, 2021, public meetings
- Staff updated NRC preliminary exceptions, clarification and additions provided in document dated January 13, 2022 (ML22013B183)
 - Includes column with proposed disposition based on:
 - Changes either identified in NEI 21-07, Revision 0-B, or staff TICAP Draft RG white paper dated December 2, 2021 ([ML21336A697](#))
 - Staff position revisited based on feedback from industry during December 14, 2021, public meeting
 - PDC and level of detail in the SAR for AOO, DBE, and BDBE disposition to be determined

NRC Draft Preliminary Exceptions, Clarifications and Additions

- Staff updated NRC preliminary exceptions, clarification and additions provided in document dated January 13, 2022
 - Potential Discussion topics:
 - Item 2a – pre-licensing engagement
 - Industry feedback on proposed staff resolution that separate licensing documents (e.g., topical reports) submitted during pre-licensing submittals as well as during application review may reduce the information that needs to be included in the SAR if incorporated by reference
 - Item 4.2.3b – defense in depth
 - Industry feedback on whether changes will be made to NEI 21-07 to address issue or issue will be address in TICAP DG

NRC Draft Preliminary Exceptions, Clarifications and Additions

- Staff updated NRC preliminary exceptions, clarification and additions provided in document dated January 13, 2022
 - Potential Discussion topics (continued):
 - Items 4.2.2.2 and 4.2.2.3 – Human Factors Engineering (HFE)
 - Industry feedback on staff's position to reference ARCAP Chapter 11 interim staff guidance to ensure holistic approach to HFE program
 - Other Questions/Comments on January 13, 2022, updated table

Next Steps

- Staff reviewing Industry Feedback on December 2, 2021, Draft TICAP White Paper (see: [ML21356A009](#) and [ML21356A008](#))
- Expectation that NEI 21-07, Revision 1, will include changes relative to PDC issue and possibly AOO, DBE, and BDBE issue discussed in this meeting
 - Timeframe for NEI 21-07, Revision 1, submittal to be determined
- Staff will update TICAP RG based on NEI 21-07, Revision 1
 - Timeframe for issuance of draft TICAP RG for public comment to be determined
 - Staff intends to issue draft Advanced Reactor Content of Application Project (ARCAP) interim staff guidance documents for public comment concurrent with draft TICAP RG
- Briefing of Advisory Committee on Reactor Safeguards (ACRS) on draft documents to be determined