



# 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- Purpose: to discuss draft guidance for advanced reactor application safety analysis reports (SARs) using Nuclear Energy Institute (NEI) 18-04's Licensing Modernization Project (LMP)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>)

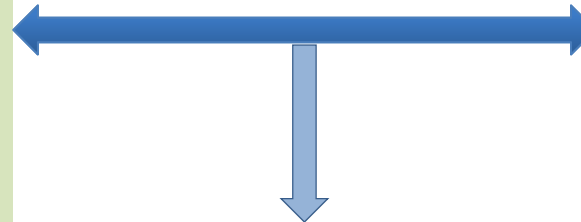
# ARCAP and Technology Inclusive Content of Application Project (TICAP) - Nexus

## **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

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## Industry Slides

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

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- 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**

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- 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

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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**

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### **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**

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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**

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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**

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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**

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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**

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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

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- 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**

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- 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**

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- 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

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- 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