

Technology Inclusive Management of Safety Case (TIMaSC) Project

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Nuclear Regulatory Commission (NRC) Public Meeting on TIMaSC

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Outline & Purpose of Today's Presentation

- Provide refresher on TIMaSC effort (Chisholm)
- Update NRC and stakeholders on project status since May 2025 (Chisholm)
- Discuss NRC Comments on TIMaSC White Paper (Nesbit)
- Overview of Current Plans for Tabletop Exercises (Tschiltz)

Primary Objectives:

1. Inform NRC staff of upcoming TIMaSC Tabletop Exercises in hopes of maximizing effective future interactions
2. Ensure effective communication to maximize alignment on key topics associated with the TIMaSC White Paper

Introduction / Overview

- Southern Company, the Department of Energy (DOE), and members of the advanced reactor industry are working on the fourth effort in a series to develop guidance for advanced non-light water reactor (non-LWR) applicants/licensees
- The approach in the guidance is technology inclusive, risk-informed (RI), and performance-based (PB)
- The intended users of TIMaSC are licensees implementing the Licensing Modernization Project (NEI 18-04) methodology through its guidance documents and associated NRC regulatory guides (see next slide)
- TIMaSC is focused on the operational phase of the plant

Licensing Modernization Project Family of Guidance

NEI 18-04 (LMP)
Licensing Basis Development

Endorsed by NRC RG 1.233

NEI 21-07 (TICAP)
SAR Content for Applicants Using LMP

Endorsed by NRC RG 1.253

NEI 22-05 (TIRICE)
Evaluation of Changes to Facility
aka "10CFR50.59 for LMP+TICAP"

Endorsement by NRC RG 1.261 pending (DG-1439)

Other RI and/or PB initiatives for Advanced Reactors (not exhaustive)

- Advanced Reactor Content of Application Project (ARCAP): DANU-ISG-2022-01 through -09
- Performance-based Emergency Preparedness (EP) Rulemaking: 10 CFR 50.160 and RG 1.242
- Risk-Informed Performance-Based Emergency Planning: NEI 24-05, currently under NRC review for endorsement
- Graded Approach to Seismic Hazard Analysis and Corresponding Site Investigations for Licensing Nuclear Power Plants: NEI 25-08, recently submitted to NRC for review and endorsement
- ASME Section XI Division 2 – Reliability and Integrity Management
- Draft proposed NRC security rule on Alternative Physical Security Requirements for Advanced Reactors
- NRC siting guidance: draft revisions to RG 4.7
- Advanced Reactor Construction Oversight Program (ARCOP)
- Advanced Reactor Oversight Program (AROP[?])
- 10 CFR Part 53 proposed rule

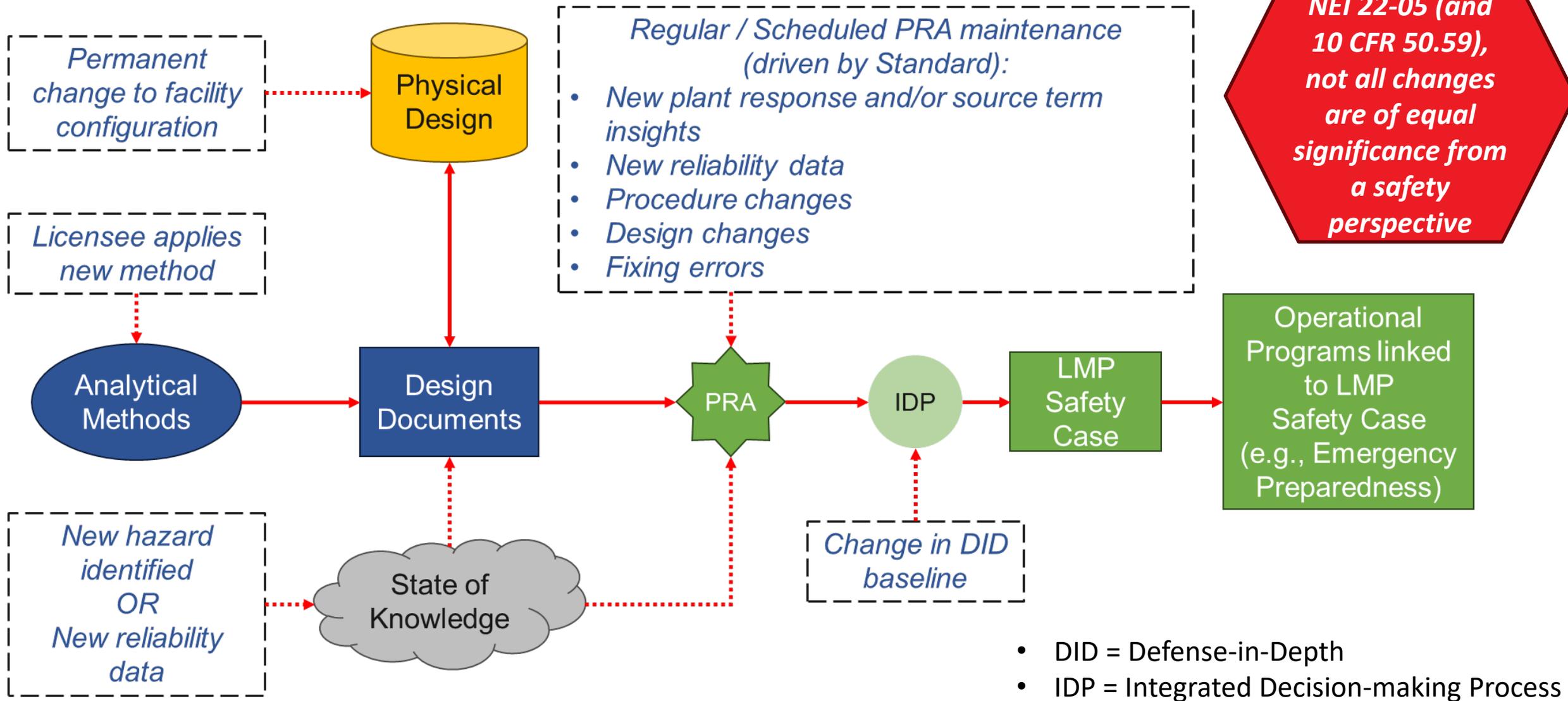
TIMaSC Need

- LMP and TICAP establish the basis for (i) the development of a safety case for a non-LWR applicant and (ii) the documentation of that safety case in the Safety Analysis Report, respectively
- ARCAP provided additional information about the broader advanced reactor licensing basis
 - Some elements of the licensing basis are “linked” to the safety case developed using the LMP methodology, while some are not
 - LMP Licensing Basis refers to that portion of the licensing basis that is developed, documented and maintained based on the LMP methodology as embodied in NEI 18-04, NEI 21-07, and NEI 22-05 and the associated NRC regulatory guides
- Once a licensing basis is accepted by the NRC and the operating license is granted, TIRICE establishes a methodology for determining if prior NRC approval is required for certain changes to the facility
 - Analogous to 10 CFR 50.59 but consistent with the risk-informed, performance-based safety case for advanced reactors
- TIMaSC provides additional guidance related to the maintenance of the LMP Licensing Basis for all changes, including those not covered by TIRICE

TIMaSC Objectives and Products

- Clarify how an RIPB safety case fits into the licensing basis for an advanced reactor under the existing NRC regulatory frameworks
 - Describe relationships using a “Network Diagram”
- Identify how changes to the RIPB safety case can be managed in a right-sized manner (i.e., such that the regulator can confirm reasonable assurance of adequate protection while optimizing focus on non-trivial changes)
 - Provide guidance (and/or considerations) for change control
- **Areas of particular interest**
 - Interactions between the plant probabilistic risk assessment (PRA) model(s) and the LMP licensing basis
 - New information (changes to the state of knowledge)
 - Considerations beyond determining whether a license amendment is required or not

What kinds of changes should be considered?



Status Update



High-Level TIMaSC Timeline

- ✓ August 2025 – provide White Paper to NRC
- ✓ January 2026 - Develop draft guidance document
- February-April 2026 - Conduct tabletop exercises
- April 2026 - Refine guidance document based on tabletop exercises
- May 2026 - Submit draft guidance document to NRC for feedback
- July-August 2026 - Revise guidance document and submit to NRC for endorsement

NRC Comments on TIMaSC White Paper



TIMaSC White Paper and Comments

- The White Paper was provided to the NRC on August 22, 2025 (see ML25239A009)
- The NRC provided comments on December 22, 2025 (see ML26007A324)
 - 28 comments are embedded in the White Paper Word file
- In the intervening time, the TIMaSC team initiated development of its draft guidance document
 - The organization and approach of the guidance document has evolved
 - As a result, some of the NRC comments are no longer applicable
- Rather than go through comments one by one, the TIMaSC team identified specific comments for discussion in today's meeting
- NOTE: Page numbers refer to the Word numbers at the bottom of the pages, not to the pdf file page numbers

NRC Comments 2, 7, and 13

[p. 2, Section 1.1; p. 6, Section 1.2; p. 11, Section 2.2] *Consider scope of TIMaSC guidance document. It has ties to LMP/TICAP/TIRICE which were for practical reasons limited in scope to non-LWRs. The timing of the guidance and ongoing rulemakings may support a broader use of a TIMaSC type framework (e.g., could easily be adapted for use for Part 53). However, expansions of applicability could also be addressed via future revisions. ...This guidance could focus only on those that picked LMP type approach. Broader topic can be separate from this document (keeping it simpler).*

- TIMaSC will to continue the focus on advanced reactors following the guidance documents associated with the LMP methodology (NEI 18-04, NEI 21-07, and NEI 22-05)
- This approach is consistent with NRC Comment 13

NRC Comments 2, 7 and 13 (cont.)

- There is no technical reason a light water reactor (LWR) could not follow the LMP methodology with appropriate adjustments
 - Adjustments would be required; for example, LMP methodology is supported by a non-LWR PRA standard that has wider scope than LWR PRA Standards (e.g., inclusion of multiple reactors and sources)
 - It would be up to an LWR applicant/licensee to identify and justify those adjustments
 - In p. 6 of the ARCAP roadmap, DANU-ISG-2022-01, the NRC staff indicated that an applicant intending to use its non-LWR guidance for an LWR application should hold preapplication discussions with the staff on its proposed approach

NRC Comments 2, 7 and 13 (cont.)

- As NRC points out in its Comment 1 (p. 1), “... *there are a number of significant changes to NRC regulations under way in response to executive orders and some of these could affect regulations mentioned in this white paper.*”
 - TIMaSC plans to monitor new and modified NRC regulations such as 10 CFR part 53, but at the present time the guidance is based on the existing NRC regulations

NRC Comments 14, 15, 19 and 24

[pp. 12-13, Section 2.3; p. 50, Section 6.2.3; p. 63, Section 6.4] Is TIMaSC “... *another change evaluation process or an umbrella type program that connects more specific items such as design, programs, performance monitoring, etc. with the analyses to maintain alignment.*” Is it “... *primarily a change evaluation process ... or a broader assessment performance monitoring program (periodic reconciling of licensing basis to actual plant design/performance)- one element of which could be an actual plant change.*” “*If constructed in a certain way, TIMaSC would itself have no specific output but would be used to integrate activities and communications.*”

- The last sentence is consistent with the intent for TIMaSC guidance – it should be a framework that assists in managing changes and maintaining the licensing basis
- Per Comment 15, it will be closely tied to the configuration control of the PRA
- To the extent practical, TIMaSC will leverage existing programs and processes (e.g., corrective action), not create a new, overarching system for regulatory compliance

NRC Comment 21

[p. 55, Section 6.2.5] *Suggest that, as much as possible, TIMaSC provide guidance on entry into possible corrective actions where the related processes would define interactions with the NRC. ... TIMaSC would then provide the roadmap but perhaps avoid the need for new criteria by using the other processes to trigger NRC interactions. Those matters not triggering an NRC interaction would nevertheless be captured in plant documents (design, procedures, PRA).*

- The TIMaSC team agrees and the comment is consistent with the approach taken for the draft guidance document.

NRC Comments 22 and 23

[pp. 61, Section 6.3.3] In reference to the application of TIRICE evaluation criteria to deterministic elements within the design basis, *“Does this warrant a discussion and possible revision to RG 1.261 (endorsing NEI 22-05) while it is still awaiting final reviews and publication? Another option would be to make a note that a DBHL be considered a Safety-Related Design Criterion in Criterion (e) which would trigger a license amendment if a SR SSC could not function when faced with a DBHL or for a proposed change to a DBHL.”*

- Consistent with the NRC comment, the TIMaSC team considers that there are adequate evaluation criteria within NEI 22-05 that address deterministic elements
- Moreover, TIMaSC considers that NEI 22-05, in its entirety, addresses the issue adequately and no changes to NEI 22-05 are needed for this reason, either directly to NEI 22-05 or through TIMaSC

NRC Comments – General

- The TIMaSC team appreciates the NRC comments and is factoring them into the development of the guidance document
- Some of the more significant comments were addressed above
- The team is prepared to address additional comments in this meeting, as desired

Initial Plans for TIMaSC Tabletop Exercises



Tabletop Exercises

- **Goals**

- Evaluate the processes in the TIMaSC guidance
- Feedback the results into guidance improvements, as needed
- Provide NRC staff the opportunity to see “under the hood”

- **Approach**

- Apply the TIMaSC guidance to various scenarios using TIMaSC team and advanced reactor developer personnel
- Exercise the Integrated Decision-Making Process
- Document the results

- **As with previous tabletop exercises, the intent is to have NRC personnel present**

- The TIMaSC team considers this an important part of the exercises and would like to work with the NRC staff to optimize valuable engagement

Tabletop Exercises

- **Status**

- Charter being developed
- Scenarios being developed

- **Schedule**

- Per the overall TIMaSC schedule, exercises are expected to in February through April 2026
- Subject to guidance availability and resources

Questions and General Discussion



Abbreviations

Abbreviation	Definition
ASME	American Society of Mechanical Engineers
ARCAP	Advanced Reactor Content of Application Project
ARCOP	Advanced Reactor Construction Oversight Program
AROP	Advanced Reactor Oversight Program
CFR	Code of Federal Regulations
DBHL	Design Basis Hazard Level
DID	Defense in Depth
DOE	Department of Energy
EP	Emergency Preparedness
IDP	Integrated Decision-Making Process
LMP	Licensing Modernization Project
LWR	Light Water Reactor
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission

Abbreviations (cont.)

Abbreviation	Definition
PB	Performance-based
PRA	Probabilistic Risk Assessment
RG	Regulatory Guide
RI	Risk-informed
SR	Safety-related
SSC	Structure, system, or component
TICAP	Technology Inclusive Content of Application Project
TIMaSC	Technology Inclusive Management of Safety Case
TIRICE	Technology Inclusive Risk-Informed Change Evaluation

Slides from Prior TIMaSC-NRC Meetings

- May 11, 2023: ML23124A375
- June 18, 2024: ML24169A107
- May 8, 2025: ML25127A294



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