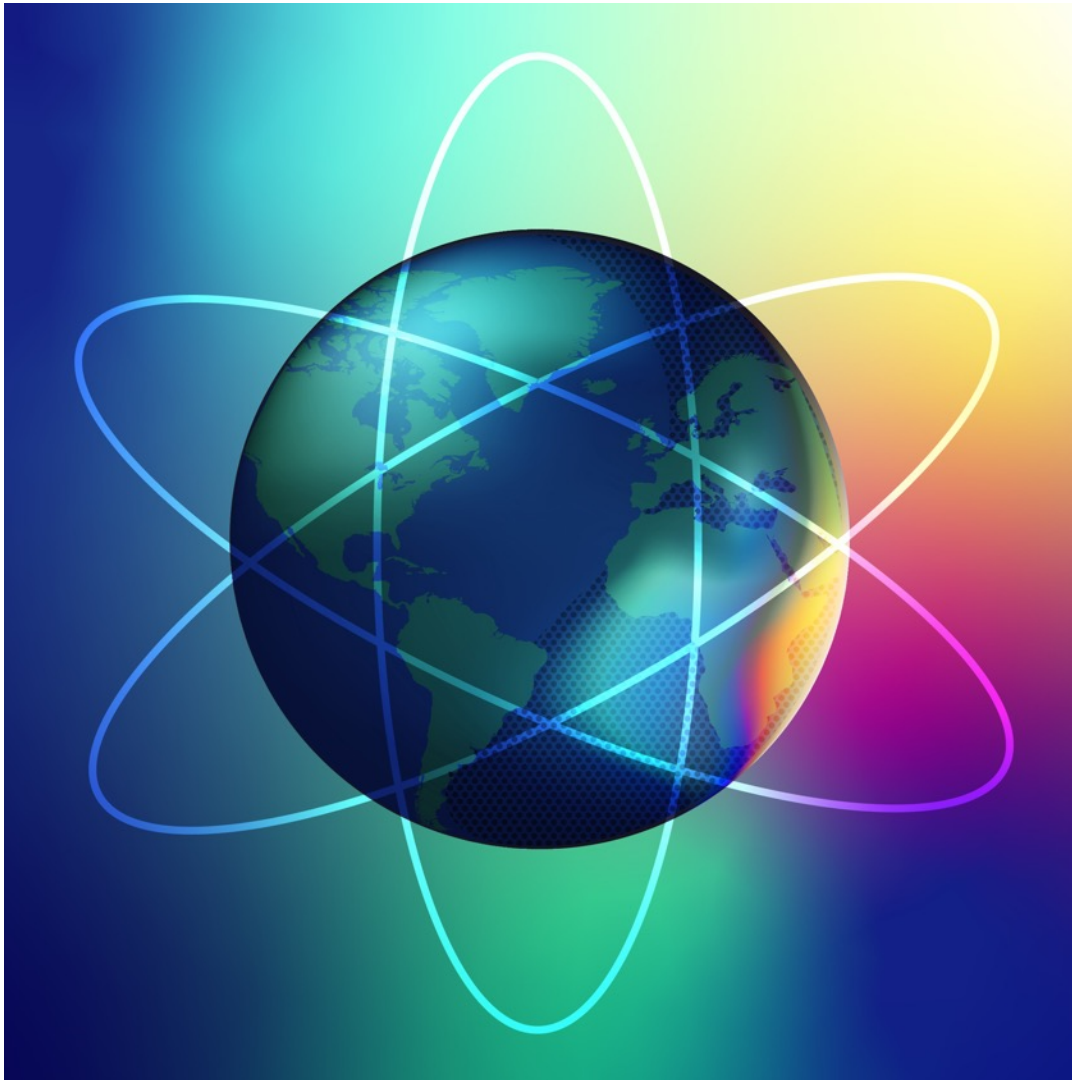




TIRICE for Facilities Using NEI 18-04 (Methodology) and NEI 21-07 (Content of Application) Guidance: Meeting to Discuss NRC Comments on NEI 22-05 Rev A

May 9th, 2023

Topics



- Project Overview
- Project Schedule
- Discussion of NRC comments
- Questions/Comments

Project Overview and Schedule



- Phase I of the Licensing Modernization Project (LMP) - Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development
 - Developed guidance (NEI 18-04) for Advanced Reactor applicants who elect to follow the approach for selection of licensing basis events; safety classification of structures, systems, and components and associated special treatments; and determination of Defense-in-Depth (DID) adequacy.
- Phase II of the LMP – Safety Analysis Report Content for Applicants Using the NEI 18-04 Methodology (TICAP)
 - The TICAP project was built on the work performed during Phase I and resulted in the development of NEI 22-07 guidance for Advanced Reactor applicants to determine content of application in combination with NRC guidance to be provided by the NRC's ARCAP project.
- Phase III of the LMP – Technology Inclusive Risk-Informed Change Evaluation (TIRICE) guidance
 - The TIRICE project builds upon the work accomplished by LMP(NEI 18-04) and TICAP (NEI 21-07) to create guidance for evaluating changes to the facility as described in the UFSAR for those licensees that have used these guidance documents.

Project Overview and Schedule

- Overall Project Schedule
 - Develop Draft Guidance document to be provided for the NRC for review in August 22 – complete
 - NRC review and endorsement FY23 (TBD)
- Develop Project Plan and establish Project Team (Dec 21-Jan 22) complete
- Develop Scope and Process papers (Feb-Mar 22) complete
- Develop White Paper based on scope and process papers (Apr-July 22) complete
- Develop Table Top Guidelines and Objectives (Apr-June 22) complete
- Develop Annotated Outline for Guidance (Apr – Jul 22) complete
- Conduct Tabletop Exercises (Jun – Jul 22) complete

Project Overview and Schedule (ctn.)



- Develop Southern Co. Draft Guidance document (Jul – Aug 22) complete
- Convert to NEI document (NEI 22-05) (Nov 22) complete
- Submit NEI 22-05 for NRC review/endorsement (FY23)
 - ARRTF review of draft NEI guidance (NEI 22-05 Rev A) – complete
 - NRC review draft NEI guidance (NEI 22-05 Rev A) – complete
 - TIRICE Team respond to NRC comments and make associated revisions to NEI 22-05 Rev A (complete)
 - TIRICE Team review NRC ARCAP guidance and related Interim Staff Guidance to determine if there is any impact to NEI 22-05 Rev A (TBD)
 - TIRICE / NEI convert NEI 22-05 Rev A to Rev 0 and submit for endorsement (TBD)

Discussion of NRC Comments



- Section 1.1 Background

- **NRC comment:** In previous public discussions on TIRICE, the NRC staff expressed the need for a separate guidance document that details the PRA change control process. In the forthcoming May 9th public meeting, the NRC staff would like to understand the status of a document of this subject.
- **TIRICE response** (Tschiltz/LeBlond): TIRICE views guidance for a PRA change control process is outside the scope of this guidance. TIRICE treats alterations to PRA methods in a manner similar to the precedent established by 10 CFR 50.59. Specifically, the scope of methods of evaluation controlled by this change process is prescribed by application of definition 3.9. Just as in 10 CFR 50.59, changes to PRA methods are outside the scope of Section 3.9 and therefore are not a part of NEI 22-05 change controls.

Discussion of NRC Comments

- Section 1.1.1 NEI 18-04 “Risk-Informed Performance-Based Technology Inclusive Guidance for Non Light Water Reactor Licensing Basis Development”
 - **NRC comment:** “methodology” and “process” keep being used for 18-04. One word should be chosen for consistency.
 - **TIRICE response** (Tschiltz): The guidance has been revised to refer to this as the NEI 18-04 methodology. Document has been revised 2 locations in the document where NEI 18-04 “process” was used to NEI “methodology” Revised text “*The NEI 18-04 methodology process includes the selection of a set of Licensing Basis Events (LBEs)...*”
 - **NRC comment:** The term “affirmative safety case” is still used here and in other locations within this draft document, even though DG-1404 states that it should be replaced with “safety analysis” or “licensing basis.”
 - **TIRICE response** (Tschiltz): TIRICE intends to wait until DG 1404 is publicly available to determine how to address this comment. The affirmative safety case term was used in NEI 21-07 and the intent is use consistent terminology between NEI 18-04, NEI 21-07 and NEI 22-05.

Discussion of NRC Comments

- Section 1.3 Purpose and Scope

- *The guidance is applicable only to licensees that implemented NEI 18-04, consistent with RG 1.233, and NEI 21-07 and the non LWR PRA standard*
- **NRC comments:**
 - What about the guidance in DG-1404? A reference to DG-1404 may be made when DG-1404 is published.
 - This should also include NEI 20-09. Also for discussion is the omission of RG 1.247.
- **TIRICE responses:** (Tschiltz)
 - TIRICE intends to defer addressing this comment until DG 1404 is publicly available for review.
 - References to NEI 20-09 and RG 1.247 made in revision.
 - *Revised paragraph: The guidance is applicable only to licensees that implemented NEI 18-04, consistent with RG 1.233, and NEI 21-07, and utilize ASME/ANS-RA-S-1.4-2021 ~~the non-LWR PRA standard~~ and, NEI 20-09, "Performance of PRA Peer Reviews Using the ASME/ANS Advanced Non-Light Water Reactor Standard," Revision 1, as endorsed by RG 1.247, Acceptability of Probabilistic Risk Assessment Results for Non-Light-Water Reactors Risk-Informed Activities, to establish the technical adequacy of the PRA, that has been issued for trial use. The NEI 18-04 methodology is also referred to as the LMP methodology, and the NEI 21-07 guidance is referred to as the Technology Inclusive Content of Application Project (TICAP).*

Discussion of NRC Comments

- Section 1.3 Purpose and Scope (ctn)
 - **NRC comment:** As mentioned in previous public discussions on TIRICE, this document should consider including a discussion on the 50.59-like change process included in the DC rules or what a 50.59-like change process would look like for an LMP-based DC
 - **TIRICE response** (Tschiltz): NRC had made a similar comment on TIRICE draft guidance Rev D. TIRICE had responded by noting that; a Part 52 DC applicant can separately address how this process could be implemented with additional change controls established for a design certification. TIRICE doesn't intend to specifically address this issue in the NEI 22-05 guidance.

Discussion of NRC Comments



- Section 1.4.1 Relationship of this Guidance to Other Processes that Control Licensing Basis Activities
 - **NRC comment:** Does this only apply to the emergency plan, or also changes that may impact the analysis that results in the EPZ sizing, per the new EP rule 50.160? NEI may want to consider adding a section in this document regarding EPZ sizing.
 - **NRC response** (LeBlond): Additional explanation added. EPZ sizing is not controlled by 10 CFR 50.59 as there is or will be a more directly applicable regulation.

Where changes to the facility or procedures are controlled by more specific regulations (e.g., quality assurance, security, and emergency preparedness program changes controlled under 10 CFR 50.54(a), (p), and (q), respectively), the more specific regulation applies. Detailed guidance is provided within section 4.1, "Applicability." This guidance includes the application of multiple regulations as required to ensure that all constituent parts of a larger activity are properly controlled by the applicable regulation.

Discussion of NRC Comments



- Section 1.4.1 Relationship of this Guidance to Other Processes that Control Licensing Basis Activities (ctn)

Where a licensee possesses a license condition that specifically permits changes to the NRC-approved fire protection program (i.e., has received the standard fire protection license condition contained in NRC Generic Letter 86-10), subsequent changes to the fire protection program would be controlled under the license condition and not this guidance. As discussed more fully within Section 4.1, "Applicability," compliance with the standard fire protection license condition would represent application of a more specific alternative regulation.

- **NRC comment**: This is not the full scope of applicable applications, as described in the comment in Section 4.1.5.
- **TIRICE response** (LeBlond): Applicability is discussed more fully in Section 4.1 and Section 4.1.5 has been revised to clarify.

- Section 4.1 Applicability

This guidance applies to licensees that follow (i) NEI 18-04 as endorsed by RG 1.233, (ii) NEI 21-07, and (iii) ASME/ANS-RA-S-1.4-2021 ~~the non-LWR PRA standard~~. Licensees that deviate from elements of NEI 18-04, NEI 21 07, or ASME/ANS-RA-S-1.4-2021 ~~the non-LWR PRA standard~~ must justify the application of this guidance.

- **NRC comment**: Endorsement by DG-1404 should be noted.
- **TIRICE response** (Tschiltz): At this point the TIRICE team has not been able to review DG-1404 and so it is inappropriate to reference it. In addition, there doesn't seem to be any benefit to referencing a draft regulatory guide.

Discussion of NRC Comments

- Section 4.1.5 Changes to Approved Fire Protection Programs

- **NRC comment:** This section is written to sound like all applicants within the scope of this guidance will have the standard fire protection license condition. It doesn't mention the possibility of the implementation of components of NFPA 805 in accordance with the draft ARCAP Fire Protection (Operations) ISG. Additionally, applicants may use 50.59, or another proposed process and associated license condition. Suggest revising this section to account for the scope of applicants that will be using this guidance.
- **TIRICE response** (LeBlond): Please note that TIRICE has not been able to review ARCAP Fire Protection ISG as it is not publicly available. However, Section 4.1.5 has been revised to clarify its application. As far as the applicability of NFPA 805, the standard states that it "... *specifies the minimum fire protection requirements for existing light water nuclear power plants during all phases of plant operation, including shutdown, degraded conditions, and decommissioning.*" In addition, change evaluation risk measures utilized in NFPA 805 (CDF and LERF) are not applicable to all advanced reactors. Therefore, as written, NFPA 805 cannot be applicable to advanced reactors.
- **NRC comment:** this screening and evaluation process" seems to refer to the 50.59 process and not TIRICE. Not sure if a historical statement like this is necessary.

Originally, change to the fire protection program under the fire protection license condition were also subject to this screening and evaluation process; however, this created confusion as to which regulatory process governed fire protection program changes.
- **TIRICE response** (LeBlond): The text contains duplicative guidance. Thus, this historical reference is not needed and has been deleted.

Discussion of NRC Comments

- Section 4.2.1.1 Screening for Adverse Effects

- NRC comment: In Section 4.2.1.5 below, Example 3 describes a change to a steamline break mass and energy release calculations that would screen out as a methodology change because the proposed activity involved a change to an input parameter (% power) and not a methodology change. This discussion goes on to state that this change should be screened per Section 4.2.1.1 to determine if it constitutes a change to the facility as described in the UFSAR that requires evaluation under Section 4.3.9 Criteria (a) through (h). However, it is not clear in Section 4.2.1.1 that such a change would be considered a change in the facility.
- NRC suggested added text: *Alternatively, nonconservative changes to inputs/assumptions in design analysis or calculations used to demonstrate compliance with safety criteria should be screened in.* (note: NRC suggested also adding a similar statement in Section 4.2.1.5)
- NRC response (LeBlond): Comments were provided actually on Example #4, not Example #3. Example #4 has been revised to better illustrate the concepts of changes to input parameters and changes to methods of evaluation. With regards to this suggested insertions, the suggested text misstates the guidance. The standard for “screening in” is an **adverse effect on a design function**, not merely a “**non-conservative change**.” The four paragraphs immediately below the suggested insertion expand on this concept for changes to safety analyses.

Discussion of NRC Comments



- Section 4.3.1 Criterion (a)

- **NRC comment:** For LBEs that are already risk-significant, it would appear that Criterion (b) wouldn't apply, only Criterion (a). Is a change that moves from the far left side of the risk-significant region to the far right of the same region (i.e., close to the F-C target line) considered as not needing NRC approval? Has this type of change been considered when developing this guidance?

Criterion (a) Result in a change to the frequency and/or consequences of one or more AOOs, DBEs, or BDBEs documented in the final safety analysis report (as updated) in a manner that would exceed (i) the NEI 18-04 Frequency-Consequence Target; or (ii) an NEI 18-04 Cumulative Risk Target

Criterion (b) Change an AOO, DBE or BDBE from non-risk significant to risk significant according to NEI 18-04 LBE risk significance criteria.

- **NRC response** (Fleming): Yes, it is correct that Criterion (b) does not apply if the LBEs are already risk significant. That is one of the reasons for including Criterion (a). Another reason is that changes which exceed the risk targets have a significantly greater risk significance than those that just exceed the risk significance criteria.

A change that moves an LBE from just exceeding the risk significance threshold to close to the risk target (such a change could result from changes in frequency, consequence, or both) would not trigger criterion (a) or (b) according to the proposed guidance. However, such a change would need to be evaluated for maintaining the adequacy of defense-in-depth using Criterion (h) because maintaining margins against the risk targets is one of the metrics used to evaluate defense-in-depth adequacy according to NEI 18-04.

Discussion of NRC Comments

- Section 4.3.4 Criterion (d)

(d) Result in identifying one or more AOOs, DBEs, or BDBEs that are (i) not previously evaluated in the UFSAR and (ii) classified as risk significant according to NEI 18-04 LBE risk significance criteria.

- **NRC comment:** Could a new DBA be related to a new non-risk significant DBE? When looking at Task 6 in NEI 18-04, the deterministic DBAs are taken from all DBEs (not just the risk-significant ones determined in Task 7c). A new DBA through this pathway would not seem to be covered by criterion (d) or any other criterion herein.
- **NRC response** (Fleming): This possibility was considered in the formulation of the evaluation criteria but was considered unlikely. Nonetheless, it is possible that if a new DBE is introduced, even if it is not risk significant, it could lead to a new DBA if the new DBE was not subsumed into an existing DBA or if it required a change to the safety classification of SR SSCs. To address this issue the following changes have been made: 1) the last sentence of the guidance under criterion (b) has been revised; and 2) a revision to criterion (d) and to the guidance paragraphs that follows have been made.

Revised criterion *(d) Result in identifying one or more DBAs not previously evaluated in the UFSAR or one or more AOOs, DBEs, or BDBEs that are (i) not previously evaluated in the UFSAR and (ii) classified as risk significant according to NEI 18-04 LBE risk significance criteria.*

The explanation following criterion (b) has been revised to add the statement that: *This criterion is not applicable to DBAs because DBAs are defined based on deterministic rules, are not selected based on frequency of occurrence, and, hence, are not amenable to application of LBE risk significance criteria. The LBE risk significance criteria apply only to AOOs, DBEs, and BDBEs. ~~risk significance applies only to AOOs, DBEs, and BDBEs~~*

Discussion of NRC Comments

- Section 4.3.4 Criterion (i)

- **NRC comment:** Why is this Criteria (i) limited to DBAs? It is not clear how the PRA change control process would evaluate changes to inputs/assumptions used in non-DBA analysis for prior NRC review. Nonconservative changes to inputs/assumptions that are important with respect to the demonstrations of performance that the analyses provide (i.e., analyses described, outlined or summarized in the UFSAR) should be evaluated for prior NRC approval. This is consistent with guidance in NEI 96-07 which does not limit this criterion to just DBA analysis.
- Statement in guidance following Criterion (i): *The UFSAR contains design and licensing basis information for a nuclear power facility, including description on how regulatory requirements for design bases are met and how the facility responds to various DBAs.*
- **NRC response** (LeBlond): The comment raises several issues. First, the question of Methods of Evaluation scope is controlled by application of definition 3.9. Second, the issue of “non-conservative changes” to input parameters that have **an adverse affect on a design function** screen in as requiring evaluation under criteria (a) through (h). Changes to input parameters are not evaluated under Criterion (i) (Section 4.3.9 Methods of Evaluation, previously discussed in response to a comment on Section 4.2.1.1 (slide 11)). To clarify, a discussion of the entire process was added, including Method of Evaluation scope as controlled by definition 3.9.

Revised text in NEI 22-05 to state: *The UFSAR contains design and licensing basis information for a nuclear power facility, including description on how regulatory requirements for design bases are met and how the facility responds to various DBAs and events. As prescribed by definition 3.9, this criterion is applicable to the methods of evaluation used in deterministic safety analyses to evaluate the consequences of DBAs, to confirm the capabilities of SR SSCs to perform their RSFs during DBAs and to confirm the adequacy of design margins in response to DBHLs.*

Discussion of NRC Comments

- Section 4.3.9 Criterion (i)

- **NRC comment**: Still not clear how changes to inputs/assumptions used in LBE analysis would be properly screened for prior NRC review by the PRA change control process. This comment relates to the very first comment regarding a PRA change control process document.
- **NRC response** (Tschiltz): Addressing a PRA change control process is outside the scope of this guidance. A proposed change to the facility that results in an **input parameter** to the PRA that has **an adverse affect on design function** would screen in and be evaluated under Criteria (a) through (h). Changes to PRA methods are covered by the non-LWR PRA Standard, ASME/ANS-RA-S-1.4-2021.



Thank You for Your Time and Attention