NUCLEAR ENERGY INSTITUTE

Use of Risk Insights to support 10 CFR 50.59 Evaluations

Industry Team Update

NRC PUBLIC MEETING
October 8, 2020

PURPOSE

- Share ideas with the NRC working team that are being considered to address the areas that were identified for opportunities to improve or clarify industry 50.59 guidance
  - Focus Area 1 - Clarifying the use of “more than minimal” as it pertains to 10 CFR 50.59
  - Focus Area 2 - Clarifying the application of GDC language contained within NEI 96-07, rev. 1
  - Focus Area 3 - Clarifying application of methods of evaluations (MOE)
- **Today’s discussion will focus on Focus Area 3**

BACKGROUND

- NRR memo dated February 28, 2019; “Timely Resolution of Issues Related to Tornado-Missile Protection” (ML18338A085)
  - On the use of 10 CFR 50.59 to restore compliance at the facility by changing the licensing basis to incorporate TMRE without prior NRC approval
- NEI/NRC public meeting held September 10, 2019 to discuss 50.59 resolution approach (ML19252A128)
  - NEI 17-02, Tornado Missile Risk Evaluator (TMRE) quantitatively determines risk impact from tornado missiles
  - TMRE was not considered a MOE per NEI 96-07, Definition 3.10
  - Focus on addressing criterion ii, “…result in more than a minimal increase in the likelihood of occurrence of a malfunction of a SSC…”

BACKGROUND (cont.)

- NRR memo dated February 7, 2020; “Timely Resolution of Issues Related to Tornado-Missile Protection-Supplemental Information” (ML20015A299)
  - Provides supplemental information from NRR memo dated February 28, 2019; “Timely Resolution of Issues Related to Tornado-Missile Protection” (ML18338A085) on the use of 10 CFR 50.59 to restore compliance at the facility by changing the licensing basis to incorporate TMRE without prior NRC approval.
  - NRC approved the plant-specific application of the TMRE method of evaluation at pilot plants.
  - Each additional licensee seeking to tornado-missile protection issues using the TMRE method would need to evaluate how the approved plant-specific conditions and limitations would apply to its facility.

BACKGROUND (cont.)

10 CFR 50.59(c)(2)(viii)

- (c)(2) - A licensee shall obtain a license amendment pursuant to Sec. 50.90 prior to implementing a proposed change, test, or experiment if the change, test, or experiment would:

  (viii) - Result in a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses.

PRELIMINARY CONCLUSION

- Used a similar approach to assessing focus areas 1 & 2
  - Review NEI 96-07 rev. 1/ RG 1.187
  - Review 1999 SOC
  - Review industry OE/past violations
  - Discuss with 50.59 practitioners
- Based on our assessment of focus area 3, “Clarifying application of methods of evaluations (MOE),” the team believes that resources should be applied at this time to opportunities identified with criterion i & ii as described in focus areas 1 & 2 versus on focus area 3.

NEI 96-07, Sect. 3.10

Methods of Evaluation

- Methods of evaluation means the calculational framework used for evaluating behavior or response of the facility or an SSC.

Discussion:

- Changes to such methods of evaluation require evaluation under 10 CFR 50.59(c)(2)(viii) only for evaluations used either in UFSAR safety analyses or in establishing the design bases, and only if the methods are described, outlined or summarized in the UFSAR. Methodology changes that are subject to 10 CFR 50.59 include changes to elements of existing methods described in the UFSAR and to changes that involve replacement of existing methods of evaluation with alternative methodologies.

NEI 96-07, Sect. 3.10

Methods of evaluation described in the UFSAR subject to criterion 10 CFR 50.59(c)(2)(viii) are:

- Methods of evaluation used in analyses that demonstrate that design basis limits of fission product barriers are met (i.e., for the parameters subject to criterion 10 CFR 50.59(c)(2)(vii))
- Methods of evaluation used in UFSAR safety analyses, including containment, ECCS and accident analyses typically presented in UFSAR Chapters 6 and 15, to demonstrate that consequences of accidents do not exceed 10 CFR 100 or 10 CFR 50, Appendix A, dose limits
- Methods of evaluation used in supporting UFSAR analyses that demonstrate intended design functions will be accomplished under design basis conditions that the plant is required to withstand, including natural phenomena, environmental conditions, dynamic effects, station blackout and ATWS.

NEI 96-07, Sect. 3.4

Departure From a Method of Evaluation Described in the UFSAR.

- Departure from a method of evaluation described in the FSAR (as updated) means (i) changing any of the elements of the method described in the FSAR (as updated) unless the results of the analysis are conservative or essentially the same; or (ii) changing from a method described in the FSAR to another method unless that method has been approved by NRC for the intended application.

NEI 96-07, Sect. 3.4

Departure From a Method of Evaluation Described in the UFSAR.

- Conservative vs. Nonconservative Evaluation Results
- Essentially the Same
- Approved by the NRC for the Intended Application

NEI 96-07, Sect. 4.3.8

Does the Activity Result in a Departure from a Method of Evaluation Described in the UFSAR Used in Establishing the Design Bases or in the Safety Analyses?

- Identify the MOE
- Determine if change constitutes a departure from a MOE
  - Changes to any element of analysis methodology that yield results that are nonconservative or not essentially the same as the results from the analyses of record
  - Use of new or different methods of evaluation that are not approved by NRC for the intended application

1999 SOC

Definitions and Guidance

- *For the purposes of this rule, a departure from a method of evaluation described in the FSAR (as updated) used in establishing the design bases or in the safety analyses means;*
  - *(1) changing any of the elements of the method described in the FSAR (as updated) unless the results of the analysis are conservative or essentially the same; or*
  - *(2) changing from a method described in the FSAR to another method unless that method has been approved by NRC for the intended application.*

1999 SOC

- *The intent is to limit the need for review to those changes to methods that could impact upon the acceptability of performance were the results to be at the limiting values.*
- *By limiting the methods to those described in the FSAR, and to those used for design bases and safety analyses, the Commission concludes that the burden of requiring review is justified in view of the relaxations in the other evaluation criteria.*

CONCLUSION

- Based on our assessment of focus area 3, “Clarifying application of methods of evaluations (MOE),” the team believes that resources should be applied at this time to opportunities identified with criterion i & ii as described in focus areas 1 & 2 versus on focus area 3.
  - NEI 96-07 rev.1 & 1999 SOC appear to be aligned regarding MOEs.
  - The steps that were taken to allow TMRE to be used as an NRC approved MOE were rigorous, including pilot plant LARs and development of safety evaluations.
    - While these steps may be acceptable for this particular circumstance, and potentially other industry generic issues, this approach would not be applicable to individually unique circumstances to accept as-is.

ORIGINAL PROBLEM STATEMENT

NEI 96-07 rev. 1 may include self imposed limitations on the ability to fully utilize the provisions allowed by 10 CFR 50.59

- Approach
  - Clarify how to risk insights when assessing “more than a minimal” increases for criterion 1 & 2
    - No immediate opportunities identified for criterion 3 & 4
  - Clarifying the application of GDC language

Summary

- Based on our assessment of focus area 3, “Clarifying application of methods of evaluations (MOE),” the team believes that resources should be applied at this time to opportunities identified with criterion i & ii as described in focus areas 1 & 2 versus on focus area 3.

NEXT STEPS / SCHEDULE

June	Public meeting – kick off/overview of focus areas
August	Public meeting – Staff feedback from June meeting/ NEI present insights from focus area 1 & 2
September	Public meeting – Staff feedback from Aug meeting/ NEI present insights from focus area 3
October	Public meeting – Staff feedback from ~~Sept~~ Oct meeting/ discuss proposed solutions/products
November	Review/prepare products
December	Prepare products for delivery (e.g., training, industry workshops)

Background Slides

NEI 96-07, Sect. 4.3.8.2

Guidance for Changing from One Method of Evaluation to Another

- Through a safety evaluation report (SER), NRC approved the use of the methodologies for a given class of power plants. In some cases, the NRC has accorded “generic” approval of analysis methodologies.
- NRC’s approval has typically been part of a plant’s licensing basis and limited to a given plant design and a given application.

NEI 96-07, Sect. 4.3.8.2

Guidance for Changing from One Method of Evaluation to Another

- Considerations for Determining if New Methods May be Considered “Approved by the NRC for the Intended Application”
  - Is the application of the methodology consistent with the facility’s licensing basis (e.g., NUREG-0800 or other plant-specific commitments)?
  - If application of the new methodology requires exemptions from regulations or plant-specific commitments, exceptions to relevant industry standards and guidelines, or is otherwise inconsistent with a facility’s licensing basis, then prior NRC approval may be required.

NEI 96-07, Sect. 4.3.8.2

Guidance for Changing from One Method of Evaluation to Another

- Considerations for Determining if New Methods May be Considered “Approved by the NRC for the Intended Application”
  - If a computer code is involved, has the code been installed in accordance with applicable software quality assurance requirements?
  - Is the facility for which the methodology has been approved designed and operated in the same manner as the facility to which the methodology is to be applied?

1999 SOC

- *Results from a changed method are conservative relative to results from the previous method, if closer to the limits or values that must be satisfied to meet the design bases.*
- *Results are "essentially the same" if they are within the margin of error needed for the type of analysis being performed, even if tending in the non conservative direction.*
- *Results are essentially the same if the variation in results because of the change to the method is explainable as routine analysis sensitivities, and the differences in the results are not a factor in determining whether any limits or criteria are satisfied.*

1999 SOC

- *The rule words were chosen to allow licensees only a small degree of flexibility in methods where the results are tending in the non-conservative direction, without burdening either the licensee or the NRC with the need to review very small changes that are not important with respect to the demonstrations of performance that the analyses are providing.*
- *The intent is to limit the need for review to those changes to methods that could impact changes to methods that could impact upon the acceptability of performance were the results to be at the limiting values.*
- *By limiting the methods to those described in the FSAR, and to those used for design bases and safety analyses, the Commission concludes that the burden of requiring review is justified in view of the relaxations in the other evaluation criteria.*