



Generic Applicability of MRP-227-A
Industry Perspective
Industry-NRC Reactor Internals Public Meeting

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Outline

- Previous NRC-Industry Applicability Deliberations
- Industry Perspective – Generic Applicability (2010)
- Industry Perspective – Generic Applicability (2012)
- Recommended Path Forward
- Questions?

Previous Deliberations: RAI 4-6

“...However, given the variability in design and operational conditions that currently exists in PWR plants, **the staff is not convinced that that the MRP-227 AMP requirements are necessarily appropriate** for each plant. For instance, it is not clear that the “out-in” core loading pattern is conservative given that some degradation mechanisms do not initiate until low-leakage core conditions are imposed in the functionality model.

Therefore, the staff requests that guidance be developed that will allow **individual licensees to assess the applicability of the MRP-227** method and results. This guidance should particularly **focus on demonstrating the applicability of (a) the FMECA and functionality assessments, and (b) the recommended inspection category, inspection method and periodicity** for each component. Specifically, this guidance should **allow a licensee to determine if plant-specific differences in the RVI design or operating conditions (i.e., power uprate level) result in different component inspection categories** (i.e., primary, expansion, existing, and no additional measures) than recommended within MRP-227.

Alternatively, additional analysis or justification may be provided to demonstrate that the MRP-227 approach and results are generically applicable such that plant-specific differences in the RVI design or operating conditions do not result in different component inspection categories than recommended within MRP-227. In that absence of adequate guidance, the staff will consider the need to implement limitations and conditions on the use of MRP-227 which would address plant-specific action items necessary to address this issue for each facility. “

Previous Deliberations: RAI 4-6 Response

“... while **another damage mechanism could play a more important role** in the overall aging of the components when a more realistic core loading history is employed, in **no case would the recommendations to detect that degradation change** because:

- the anticipated **effect and the overall degradation hierarchy would not change** and
- **no component or component assemblies have inspection requirements directed at local effects** predicted in the FEA results to the extent that a shift in degradation mechanism predominance would necessitate a change in location recommendations.

Therefore, the additional level of detail provided by the functionality analysis does identify complex structural interactions, particularly in bolted assemblies, but **did not lead to recommendations for changing the scope of examinations.**

Thus it would be a plant-specific action to **confirm the guidance in MRP-227 remains applicable** within the boundaries indicated in Section 2.4. The general framework for both the determination of applicability and the process for justifying deviations is described in industry documents and is further discussed in the response to RAI 4-7.”

Applicant/Licensee Action Item 1

4.2.1 Applicability of FMECA and Functionality Analysis Assumptions

As addressed in Section 3.2.5.1 of this SE, each applicant/licensee is responsible for assessing its plant's design and operating history and demonstrating that the approved version of MRP-227 is applicable to the facility.

Each applicant/licensee shall refer, in particular, to the assumptions regarding plant design and operating history made in the FMECA and functionality analyses for reactors of their design (i.e., Westinghouse, CE, or B&W) which support MRP-227 and describe **the process used for determining plant-specific differences** in the design of their RVI components or plant operating conditions, which **result in different component inspection categories**. The applicant/licensee shall submit this evaluation for NRC review and approval as part of its application to implement the approved version of MRP-227. **This is Applicant/Licensee Action Item 1.**

A/LAI 1 – As Understood by Industry

- Content of LAI 1 **does not indicate or imply** that the staff found the industry response to RAI 4-6 insufficient.
- First sentence of LAI 1 is similar to Industry-proposed suggestion:
 - “Each applicant/licensee is responsible for assessing its plant’s design and operating history and demonstrating that the approved version of MRP-227 is applicable to the facility.”

From RAI 4-6 response:

- **Confirm the guidance in MRP-227 remains applicable** within the boundaries indicated in Section 2.4.

A/LAI 1 – As Understood by Industry

- Second part of A/LAI 1 refers to a more rigorous, detailed evaluation when proposing different inspections:
 - “Each applicant/licensee shall refer, in particular, to the assumptions regarding plant design and operating history made in the FMECA and functionality analyses for reactors of their design (i.e., Westinghouse, CE, or B&W) which support MRP-227 and describe the **process used for determining plant-specific differences** in the design of their RVI components or plant operating conditions, **which result in different component inspection categories.**”
- Industry understood that the **NEI 03-08 deviation process** ensures a rigorous technical justification is required for **identifying and addressing differences** between the generic requirements and the plant’s specific program and that any known differences should be included in MRP-227 submittal.

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Industry Perspective: Generic Applicability (2010)

- Industry maintains that the 2010 arguments provided in RAI 4-6 response remain valid today
 - Inspection program accounts for the range(s) of numerical inputs/outputs from the screening, FMECA and FEA aging analysis
 - **Lead components remain lead components regardless** of whether other (tertiary) components “may possibly” screen in from a series of bounding analyses
- Industry considers that any remaining Staff concern with generic applicability was adequately managed via the SER Topical report conditions which greatly enlarged the inspection program scope.

Industry Perspective: Generic Applicability (2010)

- Industry acknowledges staff concerns expressed in early submittals and as presented in the July 2012 Materials Degradation Symposium
 - Generic guidance not yet issued by industry for A/LAI 1
 - Concern with not using bounding parameters
 - Concern with level of detail in applicability evaluation
- Industry strongly prefers addressing these concerns generically rather than on an individual utility basis
- Therefore, industry team recommends we establish a mutually beneficial path forward.

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Industry Perspective: Generic Applicability (2012)

- MRP Issued Submittal Template
 - Consistent with Industry Perspective presented today
 - Reasonably consistent with Programs previously submitted
- 2010-2012 Internals OE positive
 - Ginna
 - Robinson
 - Oconee
 - Surry
 - Kewaunee

Industry Perspective: Generic Applicability (2012)

- Additional Industry work in progress or completed
 - Sensitivity studies
 - Materials model benchmarking
 - PWROG acceptance criteria
 - NSSS support for Licensee power uprates
 - NSSS support for Licensee inspection implementation
 - Basis for MRP-227 Rev. 0 Condition reversal
- These efforts have reassured and strengthened Industry's initial generic applicability case
- Industry maintains that the existing items selected and timing of inspections based upon the process described adequately manages plant aging and reliability.

Industry Perspective: Path Forward

- Industry agrees with content of A/LAI 2
 - Identify / reconcile plant-specific components with generic components listed in MRP documents
- Industry maintains that assumptions of RAI response Section 2.4 are sufficient
 - Utility's action is to complete detailed evaluations where differences are identified and reconciled to support AMP
- Industry stands ready to provide staff with further details and technical information to support these conclusions.

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