

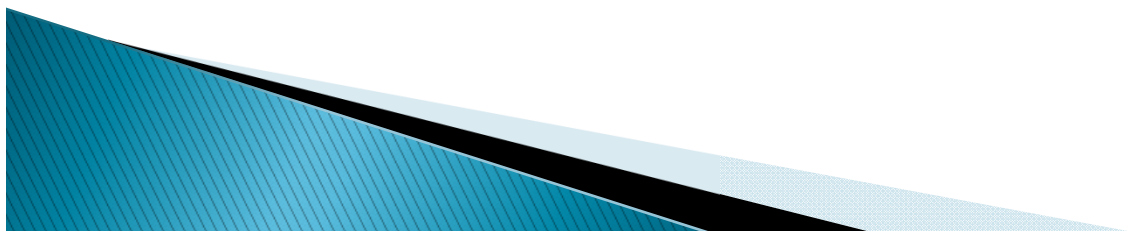
SLR PWR Vessel Internals GAP Analysis for Lead Plant

April 26, 2016

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Agenda

- ▶ Background and Objectives
- ▶ Strategy for Lead Plant and MRP Activities
 - Starting Point
 - Lead Plant GAP Analysis
 - Transition to MRP-227 Rev 2
- ▶ Gap Analysis and MRP-227 Rev 2 Timelines
- ▶ Summary and Conclusions

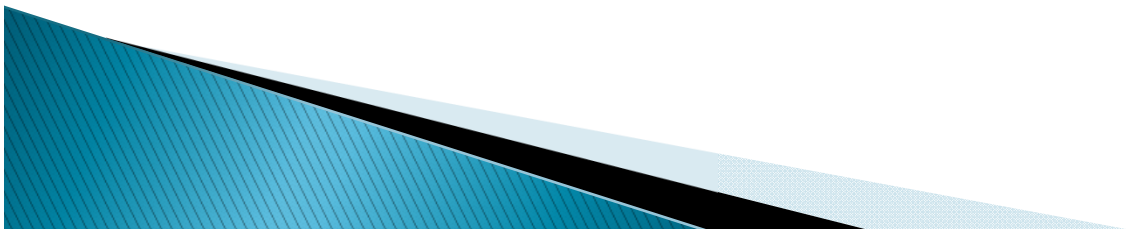


Background

- ▶ MRP-227-A and the associated NRC Safety Evaluation have become an established and an acceptable way to manage aging of the reactor vessel internals (RVI) for the first license renewal period.
- ▶ Draft GALL-SLR does not currently include reactor vessel internal (RVI) AMR lines or an AMP to manage aging of RVI
- ▶ MRP-227, Rev 2 is being created for the second license renewal period, but not in time for lead plant subsequent license renewal application (SLRA) or several other early plant SLRAs.
 - MRP-227 Rev 2 will include lessons learned from aging management of internals during the first Period of Extended Operation (PEO)
 - MRP-227 Rev 2 is anticipated to be available for NRC evaluation and acceptance in 2020

Objectives

- ▶ Propose an RVI Aging Management strategy for lead plant and early plant SLRAs
- ▶ Describe a process for developing RVI aging management guidance in advance of MRP-227 Rev 2 to support lead plant SLRA
- ▶ Provide orderly transition to MRP-227 Rev 2 guidance and associated NRC Safety Evaluation



Strategy to Provide One Acceptable Way to Manage RVI Aging Management

- ▶ Starting Point: Start with MRP-227 (most current version with NRC safety evaluation), existing RVI AMR and AMP (current baseline)
- ▶ Lead Plant GAP analysis - performed to:
 - Identify differences between current baseline and SLR guidance being developed for MRP-227 Rev 2
 - Align Lead Plant AMP with MRP aging management being developed for MRP-227 Rev 2
- ▶ Transition: Use Interim MRP Guidance and feedback from lead plant process to transition to MRP-227 Rev 2

Change Process

Changes are required to address GAPs and extend MRP-227 for aging management in the Subsequent Period of Extended Operation (SPEO)

- ▶ Changes will be informed from industry operating experience that is based on MRP-227 inspections
- ▶ Process used to prepare MRP-227 will be used to identify changes and provide MRP-227 Rev 2.
- ▶ Process will consider developments in aging degradation mechanism knowledge
- ▶ Some changes are expected – none are expected to be major changes to existing aging management strategies.

Starting Point

GALL Rev 2 AMRs and AMP (LR-ISG-2011-04) recommended to provide the baseline for identification of RVI AMP changes in SLRA

- ▶ Modify GALL Rev 2 AMR lines to reference GALL-SLR further evaluations for component degradation mechanism changes.
- ▶ Use SLR-SRP further evaluation 3.1.2.2.9 (in SLRA) to document components with “new/changed” degradation mechanisms and their aging management impacts
- ▶ Adapt MRP-227 content (in SLRA) to address aging management impacts of further evaluation
 - Enhancements to identify addition of new component examination strategy, as needed
 - Exceptions to identify changes in MRP-227 examination methodology/frequency, as needed

Lead Plant GAP Analysis: Integration With Industry Efforts to Develop MRP-227 Rev 2

- ▶ Update Lead Plant RVI component list consistent with MRP-227-A A/LAI 1 & 2
- ▶ Component degradation mechanism screening consistent with MRP-175 and MRP-191 SLR update
- ▶ Lead plant RVI inspection strategies consistent with MRP-227 SLR Interim Guidance based on changes to MRP-227 OEM tables (e.g. Table 4-3 for Westinghouse Primary Inspection Components)

Transition: Development of Interim MRP Guidance

- ▶ Provide an orderly transition to MRP-227 Rev 2 and associated NRC Safety Evaluation
- ▶ Lead plant and early plant RVI inspection strategies will be consistent with MRP-227 and will include SLR Interim Guidance based on MRP-227 OEM tables
- ▶ Prior to MRP-227 Rev 2 issue, MRP Interim Guidance will incorporate significant industry operating experience associated with inspection strategies as required
- ▶ Early Plant RVI inspection Strategies will already be consistent with MRP-227 Rev 2 when issued.
- ▶ SLR-ISG is anticipated to incorporate MRP-227 Rev 2 into the GALL-SLR

Lead Plant GAP Analysis Approach:

GAP Analysis provides integration with Industry efforts that are determining the parts of previous MRP-227 development that require update for SLR. Activities include: (those with proposed NRC briefings shown in red italic):

- ▶ Update RVI component list
- ▶ *Update aging degradation mechanism screening criteria as necessary*
- ▶ Component Screening and Evaluation
 - *Perform component screening for aging degradation mechanisms*
 - *Identify affected components*
 - Evaluate primary, expansion, and existing components examination strategies, and update as needed
- ▶ *Integrate affected components into inspection guidance*



Lead Plant Activity: Update RVI Component List

- ▶ Implement MRP-227-A A/LAI 1 & 2 and update Lead Plant RVI component list as necessary
- ▶ Confirm no component replacements or modifications since first license renewal
- ▶ Provide input to MRP-191 component and material update



MRP Activity: Update Mechanism Screening Criteria

- ▶ Simultaneous with lead plant RVI Component List Update activity
- ▶ Review MRP-175 screening criteria and identify criteria that will change
- ▶ Update of screening criteria is anticipated
- ▶ Included as part of planned MRP-191 update
- ▶ NRC Staff briefing and follow-up technical discussions planned

Industry and Lead Plant Component Screening and Evaluation (MRP-191 Update)

- ▶ Based on Lead Plant RVI Updated Component List and MRP Updated Screening Criteria
- ▶ Identify components with “new/changed” degradation mechanism (update MRP-191)
- ▶ Identify any previously identified “Category A” component where extended operation would cause aging effect to become credible.
- ▶ Provide these components for FMECA evaluation
- ▶ Provide retained list of Category A components for update of MRP-191 list of no additional measures components

Industry and Lead Plant Component Screening and Evaluation (Cont.)

- ▶ Develop re-screening and FMECA analysis of non-category A components and identify revised primary and expansion inspection components
- ▶ Issue MRP-191 update when screening inputs and inspection aging management strategies are complete
- ▶ Identify components where extended operation could affect applicability of prior functionality analysis results (update to MRP-230/232)
- ▶ Upon completion of aging management strategies, issue interim guidance for any needed changes to Primary, Expansion and Existing Programs tables of MRP-227
- ▶ Brief NRC Staff and engage with NRC in follow-up technical discussions

Lead Plant & MRP Integrated Timeline

| Activity Timeline | |
|--------------------------|--|
| Mar 2017 | ACRS Full Committee |
| Jul 2017 | GALL-SLR Issued |
| Dec 2017 | MRP-191 Rev issued |
| 4 th Qtr 2017 | MRP-227 Lead Plant Inspection Guidance Issued |
| 1 st Qtr 2019 | Surry SLRA issued for NRC review |
| 4 th Qtr 2020 | MRP-227 Rev 2 submitted for NRC review |



Summary & Conclusions

- ▶ A strategy has been provided for preparing lead plant and early plant SLRAs using MRP-227 as a starting point for RVI Aging Management
- ▶ A process has been provided to integrate development of lead plant and early plant SLR RVI AMPs with Industry activities to prepare MRP-227 Revision 2
- ▶ Considerations have been identified to transition from the GAP Analysis process to MRP-227 Rev 2 guidance and associated NRC Safety Evaluation for SLRAs
- ▶ A plan to keep the NRC fully informed and engaged during the development of MRP-227-Rev 2 and its back up documents has been developed



Meeting Closure

Are there any technical concerns
that require additional discussion?

