

Industry Program on Reactor Internals



Reactor Internals Agenda

- Operating Experience
- Guidance Development
- Examination Support
- Continuing Research
- Regulatory Interface
- Industry Roadmap

Reactor Internals Operating Experience

- Planned MRP-227 Examinations
 - Robinson
 - Summary of scope:
 - CRGT Lower Flange Welds , Upper Core Barrel Flange Weld, Baffle-Edge Bolts, Baffle-Former Assembly, & Thermal Shield Flexures
 - Summary of findings:
 - No indications and calculated coverage for CRGT flange Welds
 - Surry 2
 - Summary of scope:
 - Guide Cards, GT Flange Welds, CB Flange Weld and Hold Down Spring Height
 - Summary of findings:
 - 2 Baffle Former Bolts had UT indications but this is acceptable
 - Minimal guide card wear
- Relevant OE from non-MRP-227 examinations
 - DC Cook Unit-2 baffle bolting visual
 - No evidence of continued degradation
 - Vandellos Guide Card visual exams
 - Elevated wear rates persist, several repairs necessary
 - Westinghouse supplemental exams being assessed for MRP-227 impact
- Emergent Discoveries
 - None

Reactor Internals Guidance Development

- Component specific acceptance criteria
 - W/C-E component selection is based risk prioritization
 - Currently evaluating welds in Westinghouse / CE units
 - Evaluating all primary & Expansion components in B&W designed units
 - Using methodologies reflected in WCAP-17096 (in NRC Review)
- Supplemental Guide Card Wear recommendations
 - Draft WCAP augments MRP-227-A examinations
 - Based on NSSS model and inspection results
 - Draft WCAP currently in review
 - Likely to result in conservative changes to MRP-227-A and WCAP-17096 Acceptance Criteria Methodology
- Support for addressing Applicant / Licensee Action Items
 - Template & support for A/LAI #'s 1, 2 and 7
 - Striving for completeness, accuracy and consistency

Reactor Internals Examination Support

- Analysis Models
 - B&W Reactor Internals ‘super model’
 - Westinghouse Dynamic Response model
- PWR IVI training course
 - Employ full scale component mockups
 - Lynchburg & Waltz Mill facilities
 - Hands-on visual and UT practice
- Plant staff training for implementation of MRP-227-A
 - Outage planning
 - Risk mitigation and contingencies

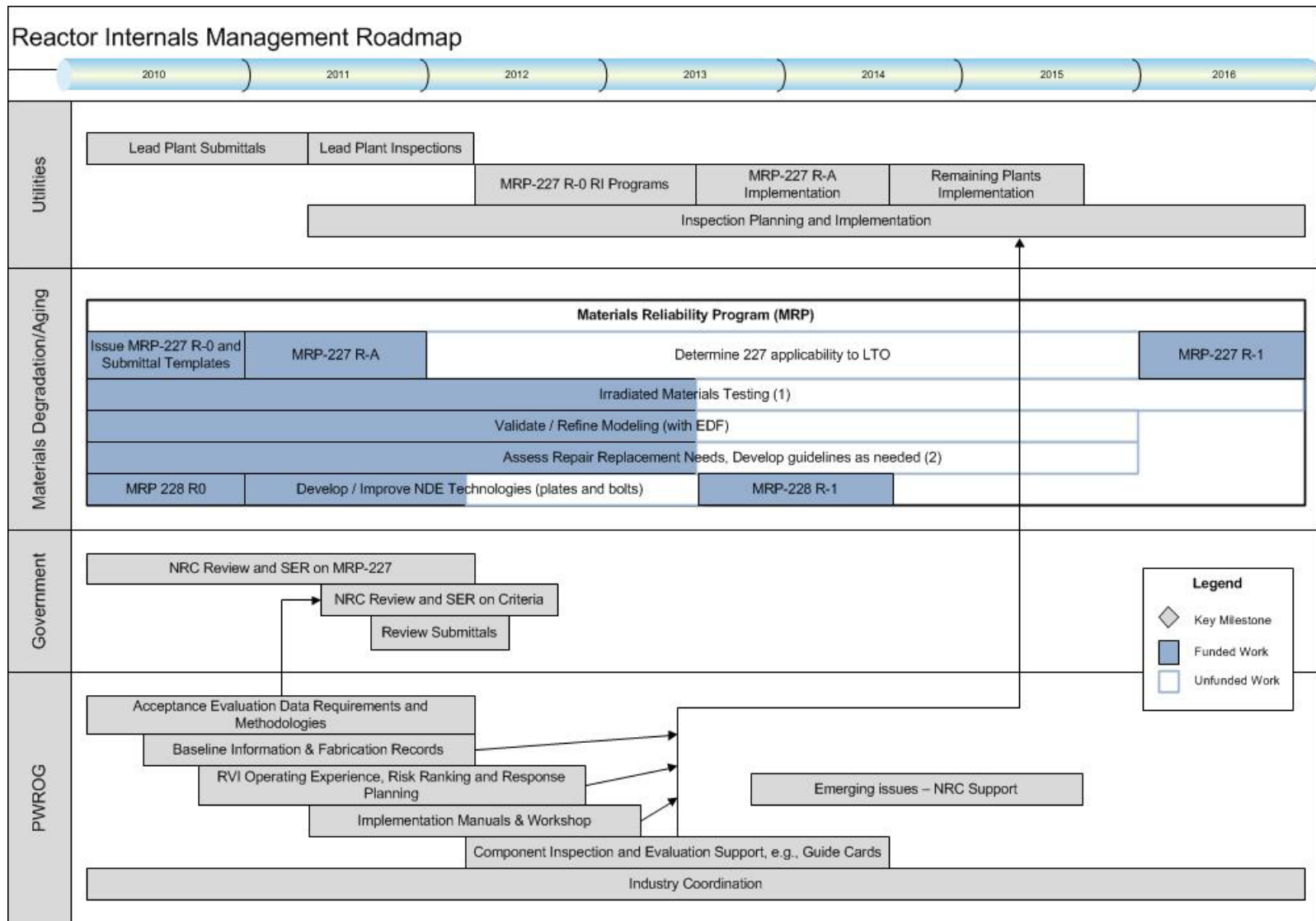
Reactor Internals Continuing Research

- Irradiated materials testing
 - Void swelling of stainless steels
 - Fluence impact on SCC and mechanical properties of stainless steels
 - Thermal and irradiation embrittlement synergistic effects on CASS & SS welds
- Repair design specifications
 - Expert panel used to identify and prioritize options
- Irradiated material welding assessment
 - Thermal neutron fluence mapping for assessing weldability
 - Development of new welding techniques
- NDE technology development
 - VT round robin support
 - Supplemental surface examination technologies (UT, laser)
- Materials model sensitivity studies
 - Characterize sensitivity of functionality analyses to input assumptions
 - Comparisons of U.S. and international assessment models

Reactor Internals Regulatory Interface

- MRP-227-A and supporting documents
 - 227-A Errata (resolution of a publication error)
 - 228 rev 1 (entirely within the MRP-228 rev-0 envelope)
 - Enhanced EVT-1 requirements for improved exam performance
 - Expect to issue this year without NRC review
 - 227-A-1, revision of the approved version
 - Expect to seek NRC approval within next few years (process?)
- WCAP-17096, Acceptance Criteria Methodology
 - Initial RAI responses recently provided
 - Feedback requested to draft “A” version
- Regulatory Guidance RIS, ISG,
 - Significant effect on schedules and license renewal applications
- Applicant / Licensee Action Items
 - Uncertainty in NRC expectations persist

Organizational Overview of Reactor Internals Interaction



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(1) See "BWR and PWR Irradiated and Testing Degradation Models" Roadmap for MRP activities
 (2) See "Welding of Irradiated Materials for BWR and PWR Internals" Roadmap for MRP activities

Questions