



Industry Executive - NRC Management Meeting  
Materials Programs

PWROG Materials Subcommittee Overview

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# NRC/Industry Executive Management Meeting

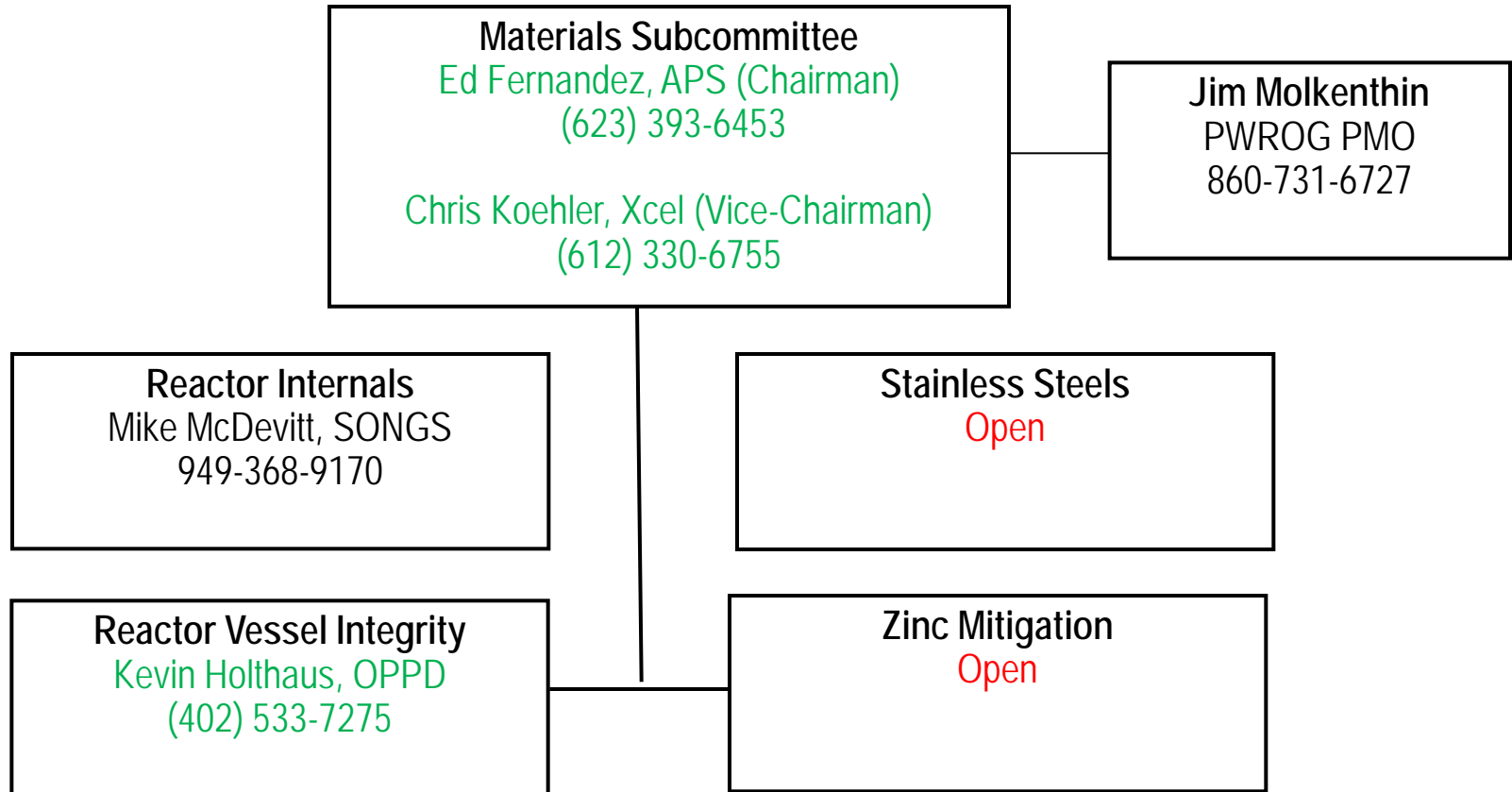
## PWR Owners Group MSC Agenda

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- PWROG MSC Key Strategic Areas & Core Teams
- PWROG MSC Key Deliverables Completed in 2011, Early 2012
- PWROG MSC Key Focus Activities for 2012 – 2013
- Emerging Issues/Recent Interactions
- MSC – NRC Interactions Summary

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## PWROG MSC Key Strategic Areas & Core Team Organization



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## PWROG MSC Key Deliverables Completed in 2011, Early 2012

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### Reactor Internals

- Development of Generic Acceptance Criteria for W and CE Reactor Internals – MRP-227 Primary and Expansion Components(PA-MSC-0784) – **Complete**
  - The purpose of the program was twofold:
    - Create generic acceptance criteria for primary and expansion components for both Westinghouse and Combustion Engineering (CE) plants.
    - Develop tools to facilitate consistent plant-specific implementation of acceptance criteria in the CE and Westinghouse fleet.
- Key Deliverables – WCAP-17499-P, Rev. 0, “Plant Groupings and Input Data for Selected MRP-227 Reactor Internals Primary and Expansion Component Generic Acceptance Criteria for Westinghouse and Combustion Engineering Designed Nuclear Steam Supply Systems”
- Revision 1 (In progress) – Perform “**Crack Growth Rate Analysis – Flaw Tolerance**” for the participating plants.

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## PWROG MSC Key Deliverables Completed in 2011, Early 2012

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### Stainless Steel

- Development of I&E Guidelines for ID and OD-Initiated SCC of PWR SS Pressure Boundary Components (PA-MSC-0551) – **Phases I and IA Complete**
  - The purpose of the program is to develop I&E Guidelines for pressure boundary stainless steel systems that are potentially susceptible to ID and OD-initiated SCC
  - This will involve three phases:
    - ✓ Phase 1 & 1A: Establish Screening Criteria (**Complete**)
    - ✓ Phase 2: Operability Risk Ranking (**to begin in 2013**)
    - ✓ Phase 3: Develop I&E Guidelines (**to begin in 2013**)

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## PWROG MSC Key Focus Activities for 2012 – 2013 (1/2)

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### Reactor Internals Programs:

- ✓ PA-MSC-0568 - Reactor Internals Operating Experience Review, Risk Ranking and Response Planning
- ✓ PA-MSC-0688 - Westinghouse Upper Internals Guide Tube Card Wear – Fleet-wide Operational Projections
- ✓ PA-MSC-0784, Task 2 - Development of Generic Acceptance Criteria for W and CE Reactor Internals
- ✓ PA-MSC-0473 - Reactor Internals Acceptance Criteria Methodology & Data Requirements
- ✓ PA-MSC-0835 - B&W Plant Reactor Internals Phase II MRP-227
- ✓ PA-MSC-0562 – RV Internals MRP-227 Implementation Manual and Training Workshop
- ✓ PA-MSC-0942 - Dynamic Response Model of Westinghouse Internals
- ✓ PA-MSC-0983 - Support for Applicant Action Items 1, 2, and 7 from the Final Safety Evaluation on MRP-227, Revision 0

*The programs are designed to support utility implementation of MRP-227.*

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## PWROG MSC Key Focus Activities for 2012 – 2013 (2/2)

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### Reactor Vessel Integrity

- PA-MSC-0559 - Extended Beltline Technical Approach (**Just Completed**)
- PA-MSC-0783 - Archival of Westinghouse and CE Unirradiated Reactor Vessel Materials
- PA-MSC-0440 – ISI Interval Extension for Non- Alloy 82/182 RV Nozzle to Piping Welds

### Stainless Steel

- PA-MSC-0918 – SCC of SS Issues, Industry Participation and Strategic Planning Support
  - ✓ PWROG has overall industry lead for this issue

### Other

- PA-MSC-0569 – Revision 2 to WCAP-15988-NP “Generic Guidance for an Effective Boric Acid Inspection Program for Pressurized Water Reactors” (**Just Completed**)
- PA-MSC-0257 - PWSCC Crack Initiation Testing of Farley Unit 2 Alloy 600 CRDM Penetrations

# NRC/Industry Materials Programs Technical Exchange

## Emerging Issues/Recent Interactions (1/4)

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### Update on PWROG Seal Encapsulation Guidance

- **Background**

- Seal caps, also known as leakage encapsulation devices, have been installed on some valves in the nuclear fleet, as a means to arrest or prevent leakage at the body to bonnet flange (e.g., gasket leakage). Encapsulation devices may have been installed during plant start up to prevent leakage from the valve or later in plant life after leakage from the main flange joint had already begun.
- Recent industry events have raised concerns by the NRC with these devices.
- The PWROG has been given the lead to address this issue and has been working with the NRC.



# NRC/Industry Materials Programs Technical Exchange

## Emerging Issues/Recent Interactions (2/4)

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### Update on PWROG Seal Encapsulation Guidance (continued)

- **Latest Activities**

- An industry survey was sent out to the entire fleet. The survey indicated the following:
  - 6 sites with 8 units currently have them installed
    - ✓ Sites are WCNOG, STP 1 and 2, Harris, Vogtle 1 and 2, Seabrook and Robinson.
  - There are 25 seal caps installed at various locations at the 8 units. Currently out of the 25 installed caps, plants plan or have initiated Work Orders to remove 13 seal caps. This is based on feedback from the entire fleet of PWRs.
- The PWROG is also in the process of finalizing guidance in line with the NEI 03-08 initiative with the intent for it to be in place to support the Fall 2012 outages.

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## Emerging Issues/Recent Interactions (3/4)

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### Update on PWROG Heater Sheath Work

- **Background**

- Recently, there have been events involving stainless steel pressurizer heater failures that have emerged within the industry. The general guidance provided thus far has been to remove the failed heaters as soon as possible to preclude structural damage to the primary pressure boundary.

- A heater failure results when the heater elements cannot conduct current to adequately provide heat to the pressurizer environment as designed. There are two main root causes for heater failure.

- The first involves a purely electrical shortage,
    - While the second involves electrical failure as the result of a breach in the pressurizer heater sheath. Primary water can penetrate to the heater insulation and the heater elements. This damage can subsequently cause heater swelling that has been shown to potentially lead to structural damage in units.

# NRC/Industry Materials Programs Technical Exchange

## Emerging Issues/Recent Interactions (4/4)

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### Update on PWROG Heater Sheath Work (continued)

- Westinghouse has issued Technical Bulletin 11-8, revision 1 which provides recommended actions for failed heaters.
- **Latest Activities**
  - The PWROG has proposed a program that would begin in 2013 that would provide a methodology for acceptance of failure pressurizer heaters.

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## MSC – NRC Interactions Summary

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- PWROG MSC Interactions with the NRC have been valuable
  - NRC informed about PWROG projects
  - PWROG becomes aware of NRC issues
  - Benefits to both PWROG members and NRC
  - Facilitates utility submittals and NRC reviews
  - ✓ Significantly contributed to success of RPV ISI Interval Extension from 10 to 20 years and complementary program to extend ISI Interval for non-Alloy 82/182 RPV nozzle welds.
  - ✓ Recent OE on ODS/CC of stainless steels lead to interim strategy that was communicated and provided to the NRC.
  - ✓ Recent OE on Seal Encapsulation strategy that was communicated to the NRC and currently being worked on to provide guidance in line with the NEI 03-08 initiative.

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# Questions?