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June 2023 NRC/Industry Materials Technical Exchange Meeting

Corey Thomas – PWROG MSC Vice-Chair (SNOC)

PWR Owners Group MSC Agenda

- **Overview and Significant Program Updates Since the Last Meeting**
 - Create Revision 3 to WCAP-15988-NP “Generic Guidance for an Effective Boric Acid Inspection Program for Pressurized Water Reactors”
 - Thermal Sleeve Flange Wear Rate Data Evaluations and Guidance
 - Dynamic Interaction Study for Thermal Shield Support Degradation at WEC Plants
- **Status of Reports Submitted to the NRC**
- **Expected Report Submittals to the NRC**
- **NEI Guidance Issued in the Last Year Under the PWROG MSC**
- **OE of Interest Since Last Meeting (see other PWROG presentations, Auxiliary Piping SCC and Core Barrel Cracking)**
- **PWROG MSC Organization Chart**



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Overview and Significant Program Updates Since the Last Meeting

Boric Acid Inspection Guidance Updates

- **WCAP-15988-NP, Revision 3, “Generic Guidance for an Effective Boric Acid Inspection Program for Pressurized Water Reactors” – Recently Completed Work**
 - Because WCAP-15988 was last revised in June 2012, a revision of the report was warranted, based on feedback from members of the Boric Acid Users Group (BAUG). This coordinated effort led to the development of Revision 3 which permits consistent inspection practices, utilizing recent operating experience, lessons learned, and industry guidance.
 - Revision 3 also integrates tools and guidance developed by the Boric Acid Users Group (BAUG), which is an industry group that was formed subsequent to the previous revision of the report. Updates have also been made related to new or revised industry documents. The report also contains NEI 03-08 requirements that have remained unchanged from Revision 2 of the report.
 - Each PWR utility is required to have a Boric Acid Corrosion Control Program (BACCP)
 - The BACCP is required to encompass all of the objectives described in Section 4 of the report. The titles, organization, and number of these objectives in each plant specific program may vary, so long as all of these objectives are met by the BACCP.

Thermal Sleeve Flange Wear Rate Data Evaluations and Guidance – Ongoing Work (draft report issued)

- **PWROG-23010-NP, Revision 0, “Outline for Thermal Sleeve Flange Wear Rate Study**
- The Phase 1 report provides:
 - A comprehensive list of plants that have performed thermal sleeve flange wear inspections and compile available wear measurements
 - Compiles a list of plant parameters and design information (i.e. “metadata”) to be used to draw correlations with plant measurement data
 - Develops and outline framework for a data storage platform to house the measurement data and metadata associated with each plant. **Work to be completed as part of Phase II.**
 - Defines the steps for data analysis and reporting of results. This includes an exploratory data analysis study to determine the most suitable data model to evaluate the above information. **Work to be completed as part of Phase II.**
- The work:
 - Supports the definition of refined wear rates and associated thermal sleeve flange wear life projections by using data analysis to understand relative significance of factors driving flange wear
 - Supports development of a strategy for more focused inspections and preparedness for future thermal sleeve mitigation strategies

Dynamic Interaction Study for Thermal Shield Support Degradation at WEC Plants – Ongoing Work

- The purpose of this ongoing work is to extend the dynamic interaction study for the Salem Unit 1 degradation to generically apply to all WEC thermal shield plants
 - By analyzing common levels degradation across 2-loop, 3-loop, and 4-loop designs, understanding can be gained to the risk of cascading degradation
 - Are 4-loop plants unique?
 - What level of flexure degradation is necessary before cascading degradation becomes a significant asset management concern?
- Benefits of the work include:
 - Gaining utility knowledge to help with their asset management plan in the event thermal shield flexure degradation is identified at their plant
 - Assisting in the generation of interim guidance if needed and,
 - Building upon the downstream effects in MRP-191 Rev. 2 Supplement 1



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Status of Reports Submitted to the NRC

WCAP-17096, Revision 3, "Reactor Internals Acceptance Criteria Methodology and Data Requirements"

- Response to Request for Additional Information, RAIs Associated with WCAP-17096, Revision 3, "Reactor Internals Acceptance Criteria Methodology and Data Requirements" submitted to the NRC on 1/18/2022 under OG-22-19
 - Final SE expected by 6/30/2022. Once finalized the "Approved" version will be issued.

PWROG-18068-NP, Revision 1, "Use of Direct Fracture Toughness for Evaluation of RPV Integrity"

- PWROG-18068-NP, Revision 1, "Use of Direct Fracture Toughness for Evaluation of RPV Integrity" submitted to the NRC for review and approval on 7/27/2021 under OG-21-144
- Call held in mid-May to discuss draft RAI responses. Working to submit RAIs formally.



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Expected Report Submittals to the NRC

WCAP-17096, Revision 4 and 5, "Reactor Internals Acceptance Criteria Methodology and Data Requirements"

- Revision 4 to be submitted in late 2023, early 2024 to address BWRVIP-100 questions for PWROG fleet. This will address an open item from the Revision 3 submittal.
- Revision 5 to most likely be submitted in late 2024, early 2025 to update the topical as follows;
 - Addition and/or removal of component methodologies consistent with MRP-227, Rev. 2
 - Confirm methodologies remain applicable for subsequent license renewal and any changes in inspection requirements
 - Incorporate lessons learned and operating experience



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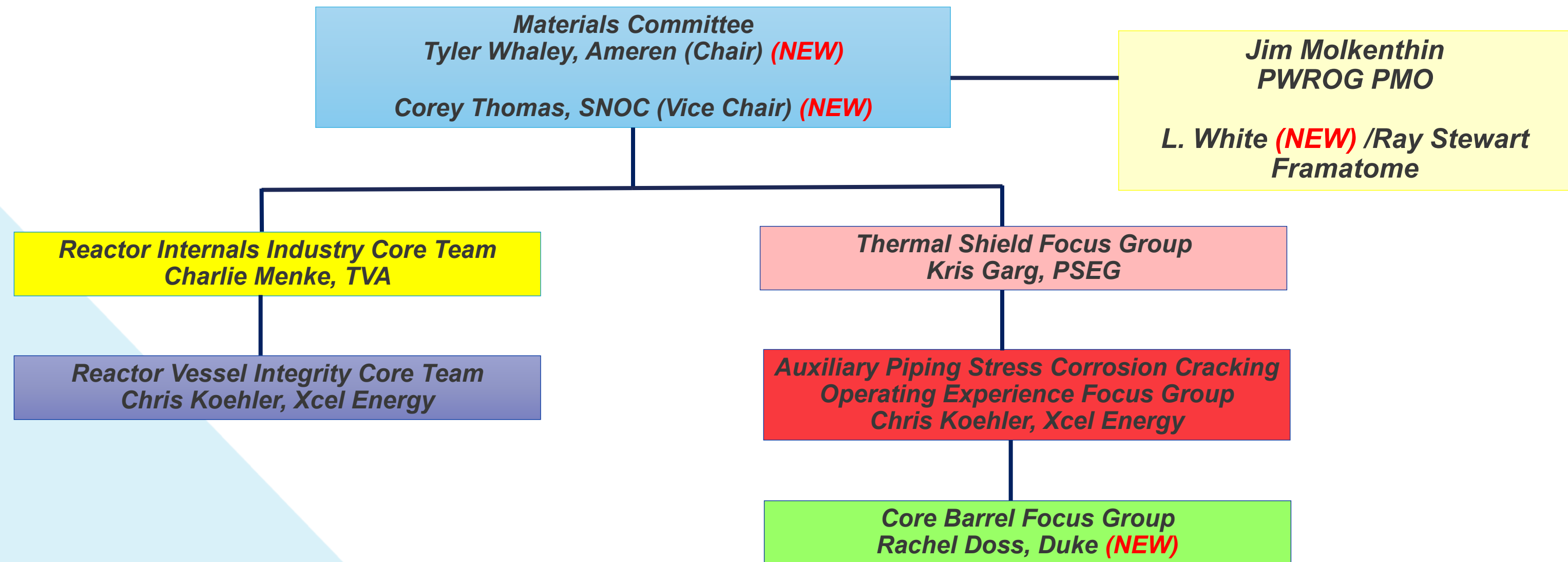
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NEI 03-08 Guidance

PWROG MSC NEI 03-08 Guidance Documents – Mandatory & Needed

| Doc Number | Rev | Document Title | Date | Implementation Level | Comments |
|--|-----|---|----------|----------------------|---------------------|
| Documents Incorporated Within (i.e., issued prior to the initiative) or Under the Materials Initiative (i.e., issued since the initiative) | | | | | |
| OG-23-63 | 0 | NEI 03-08 Needed Guidance: PWR Thermal Shield Flexure Inspection Requirements | May 2023 | Needed | OG-23-63, 5/8/2023 |
| PWROG-23007-NP | 0 | NEI 03-08 Needed Guidance: PWR Auxiliary Piping Inspection Method | May 2023 | Needed | OG-23-82, 5/10/2023 |

MSC PWROG Core/Planning Team Organization and Key Contacts



Questions?

The Materials Committee is established to provide a forum for the identification and resolution of materials issues including their development, modification and implementation to enhance the safe, efficient operation of PWR plants.