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Corey Thomas, SNOC (MSC Chair) – PWROG Materials Committee Update - Presentation #3

June 2025 NRC/Industry Materials Technical Exchange Meeting

PWR Owners Group MSC Agenda

- Overview and Significant Activities Since the Last Meeting
  - Update to Clevis Insert Bolt Inspections
- Status of Reports Submitted to the NRC
- Expected Report Submittals to the NRC
- NEI Guidance Issued Since the Last Meeting Under the PWROG MSC
  - Deviations Issued Since the Last Meeting Under the PWROG MSC
- OE Updates of Interest Since Last Meeting (see other PWROG presentations, Auxiliary Piping SCC and Core Barrel Cracking Focus Group Updates)
- PWROG MSC Organization Chart

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Overview and Significant Activities Since the Last Meeting

Clevis Insert Bolt Update(1/3)

Clevis Insert Type(1) (Plant Design)	Plant Name	Age of Plant at Time of Inspection	Total Number of Bolts	Number of Bolts with No Recordable Indications (NRI)	Number of Non-Testable Bolts	Number of Bolts with Recordable Indications (RI)
2A (WEC 2-Loop)	Plant A(2)		32	---	---	8(4)
	Plant B	50 years	32	18	4	10
2B (WEC 4-Loop)	Plant C		48	7	3	38
	Plant D	39 years	48	7	8	33
	Plant J	40 years	48	21	3	24
	Plant K		48	47	0	1
	Plant N		48	36	0	12
	Plant O		48	9	0	39
2C (WEC 3-Loop)	Plant E		32	16	16	0
	Plant F	50.5 years	32	30	1	1
	Plant G	50.3 years	32	28	0	4
	Plant L	52 years	32	10	0	22
4 (WEC 4-Loop)	Plant H(2)		48	---	---	29(3)
	Plant I(2)		48	---	---	2
CE	Plant M		24	24	0	0

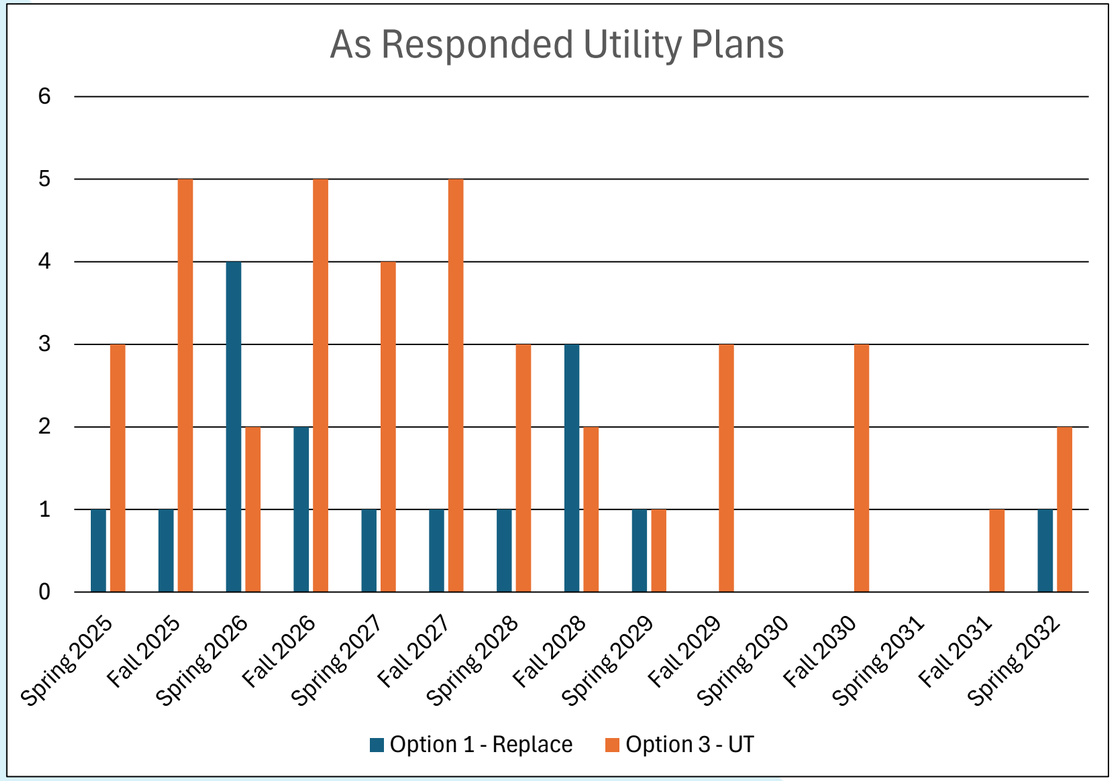
Notes:

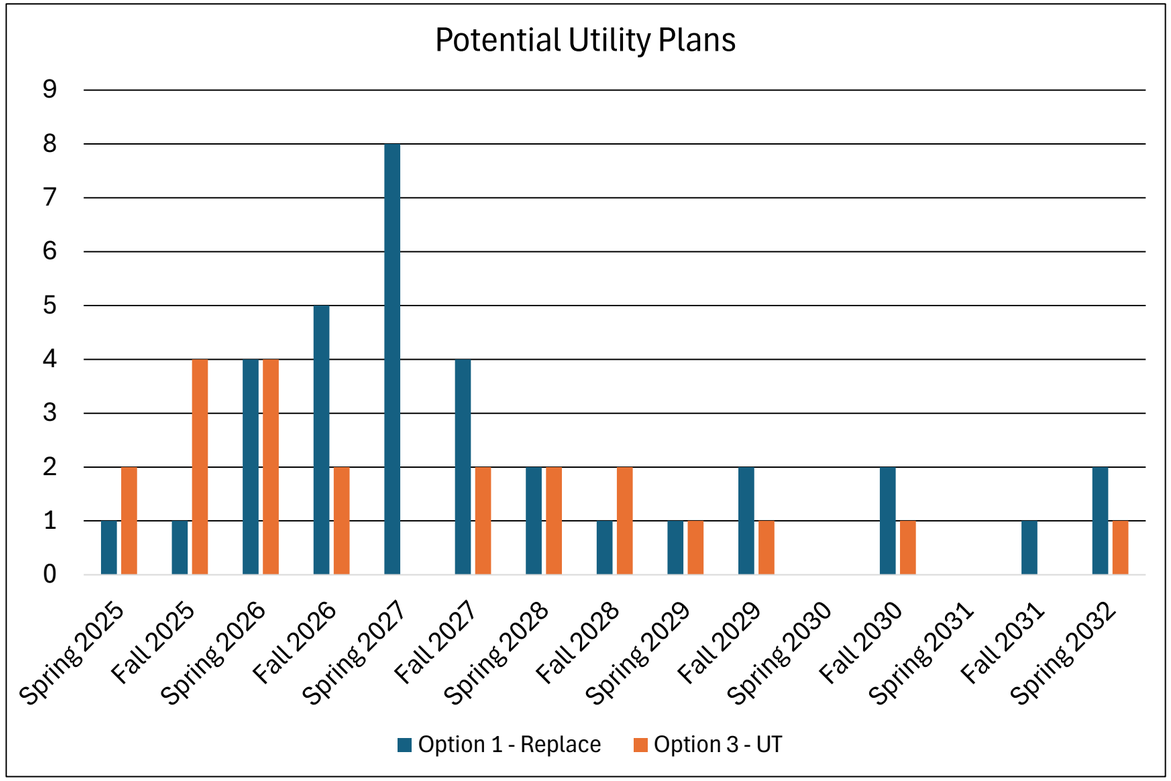
1. Clevis Insert Types defined in PWROG-15034-P and PWROG-19023-P.
2. Degradation identified via visual examination.
3. While only 7 bolts were found to be degraded during visual inspections, a total of 29 bolts were found to be degraded when removed during the replacement campaign.
4. Detected via a dislodged clevis insert; no visual signs of lock bar or bolt head degradation existed.
5. All bolts were inspected with UT examination techniques unless otherwise specified by Notes 2 and 3.

Clevis Insert Bolt Update(2/3)

- The clevis bolt survey continues to be maintained to reflect the latest plans being communicated by utilities
  - Starting in 2026 it is expect that the number of replacements each outage season will increase significantly
  - For plants with outages in 2026 and beyond, early engagement with vendors is necessary to allow for effective outage season planning to support the fleet
  - Planned 2025 inspections:
    - Spring 2025
      - Type 2B – 2 Units
    - Fall 2025
      - Type 2B – 2 Units
      - Type 2C – 2 Units

Clevis Insert Bolt Update(3/3)





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Status of Reports Submitted to the NRC

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

- Report submitted to the NRC for review and approval in July 2021 under OG-21-144
  - Report issued to NRC in April 2025 under PWROG letter OG-24-76
  - Waiting for NRC Verification Letter to issue final “Approved” version

WCAP-15987-P Supplement 1, Rev 0-C - " Technical Basis for Extending the Dye Penetrant Examination Frequency for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations “

- Report submitted to the NRC for review and approval in April 2025 under OG-25-85
  - Waiting for RAIs

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Expected Report Submittals to the NRC

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

- Timing of Revision 4 being looked at. Goal is to get all documents on the same timeline.
- Update the topical to look at the following:
  - MRP-227, Rev. 2 changes
  - Addressing certain Limitations and Conditions from WCAP-17096-NP-A, Rev. 3 SE
  - Lessons Learned from WCAP-17096-NP-A, Rev. 3
  - Degradation Interactions

Justification of a 12-Year Re-Inspection Interval for MRP-227 Components

- Submittal of topical in 3rd/4th quarter of 2025
- Aligning MRP-227 exams, especially those requiring a core barrel pull, with the inspection schedule in Code Case N-921 benefits utilities since it allows for synergies between the inspections to be recognized and minimizes the number of core barrel pulls. The justification that will be developed in the report to provide the technical basis required to extend the inspection interval for MRP-227 components currently with a 10-year re-inspection interval.

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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)					
PWROG-23007-NP, Rev. 0	0	NEI 03-08 Needed Guidance: PWR Auxiliary Piping Inspection Method	May 2023/**July 2024**	Needed	OG-23-82, 05/12/2023 and **OG-23-82R1, 7/9/24**

The purpose of revision 1 to the letter is to add Attachment 1, which provides a list of frequently asked questions and answers to assist in the guidance request that was issued under revision 0 of the letter.

PWROG/MSC Deviations(2/3)

Doc Number	Rev	Document Title	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-21-160	1	NEI 03-08 Needed Guidance: PWR Lower Radial Support Clevis Insert X-750 Bolt Inspection Requirements”	**Needed (2024) – New**	Constellation submitted to the PWROG a NEI 03-08 deviation to PWROG letter OG-21-160, Revision 1. This deviation is from OG-21-160, Revision 1 defers any ultrasonic (UT) examination or proactive replacement of clevis insert bolts at Ginna Unit 1 from refueling outage G1 R45 in 2024 to refueling outage G1 R48 in 2029, which is beyond 55 calendar years of unit operation. Deviation review documented under OG-24-110.
OG-23-63	0	“NEI 03-08 Needed Guidance: PWR Thermal Shield Flexure Inspection Requirements”	**Needed (2024) – New**	Dominion Energy submitted to the PWROG a NEI 03-08 deviation to PWROG letter OG-23-63 regarding deferral of neutron noise monitoring of the thermal shield flexures by three months to October 2024 for the North Anna Units 1 and 2. Deviation review documented under OG-24-113.
OG-23-63	0	“NEI 03-08 Needed Guidance: PWR Thermal Shield Flexure Inspection Requirements”	**Needed (2024) – New**	AEP submitted to the PWROG a NEI 03-08 deviation to PWROG letter OG-23-63 regarding deferral of neutron noise monitoring of the thermal shield flexures by less than three months to September 2024 for the DC Cook Units 1 and 2. Deviation review documented under OG-24-117.

PWROG/MSC Deviations(3/3)

Doc Number	Rev	Document Title	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-21-160	1	NEI 03-08 Needed Guidance: PWR Lower Radial Support Clevis Insert X-750 Bolt Inspection Requirements”	**Needed (2024) – New**	TVA submitted to the PWROG a NEI 03-08 deviation to PWROG letter OG-21-160, Revision 1 delaying implementation of the guidance contained in OG-21-160R1 for two cycles (from U2R26 to U2R28) for Sequoyah Unit 2. Deviation review documented under OG-24-123.
OG-21-160	1	NEI 03-08 Needed Guidance: PWR Lower Radial Support Clevis Insert X-750 Bolt Inspection Requirements”	**Needed (2024) – New**	NextEra/FPL submitted to the PWROG a NEI 03-08 deviation to PWROG letter OG-21-160, Revision 1 delaying implementation of the guidance contained in OG-21-160R1 from October 5, 2025 (or 55 years of commercial operation) to the spring 2028 outage (P1 R44) for Point Beach Unit 1. Deviation review documented under OG-24-161.

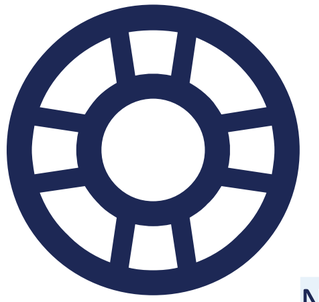
PWROG MSC Key Contacts

MSC Leadership

Name	Utility	Role
Corey Thomas	SNOC	MSC Chairman
Osvaldo Cruz	PSEG	MSC Vice Chair

Reactor Vessel Integrity Lead

Name	Utility/Vendor
Chris Koehler	Xcel Energy
Brian Hall	Westinghouse



Reactor Internals Lead

Name	Utility/Vendor
Osvaldo Cruz	PSEG
Dave DiBasilio	**Westinghouse**

Core Barrel Focus Group

Name	Utility
Josh Morton	**Vistra**
Bryan Wilson	Westinghouse

Auxiliary Piping Stress Corrosion Cracking Operating Experience Focus Group

Name	Utility
Mark Honeycutt	Duke
Craig Wicker	Framatome

PWROG Program Management Office

Name	Vendor	Role
Jim Molkenthin	W	MSC PD
Josh Mason	Framatome	MSC Fram lead

RED - NEW

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.