



# Materials Reliability Program (MRP) Inspection Technical Advisory Committee (TAC) Report Out



**Dale Brown**, Southern Nuclear  
MRP Inspection TAC Chair

2025 Industry/NRC NDE Technology Information Exchange Meeting  
Rockville, MD  
January 21 – 23, 2025

# Outline

- Membership Status
- Deliverables
- Key Technical Topics
  - MRFA 1 – RPV Internals Management
  - MRFA 3 – Nickel-base Alloys
  - MRFA 5 – Fatigue
- New Projects for 2025
- Questions / Discussion



# Membership Status

# MRP Inspection TAC Contacts

- ***Dale Brown, Southern Nuclear***

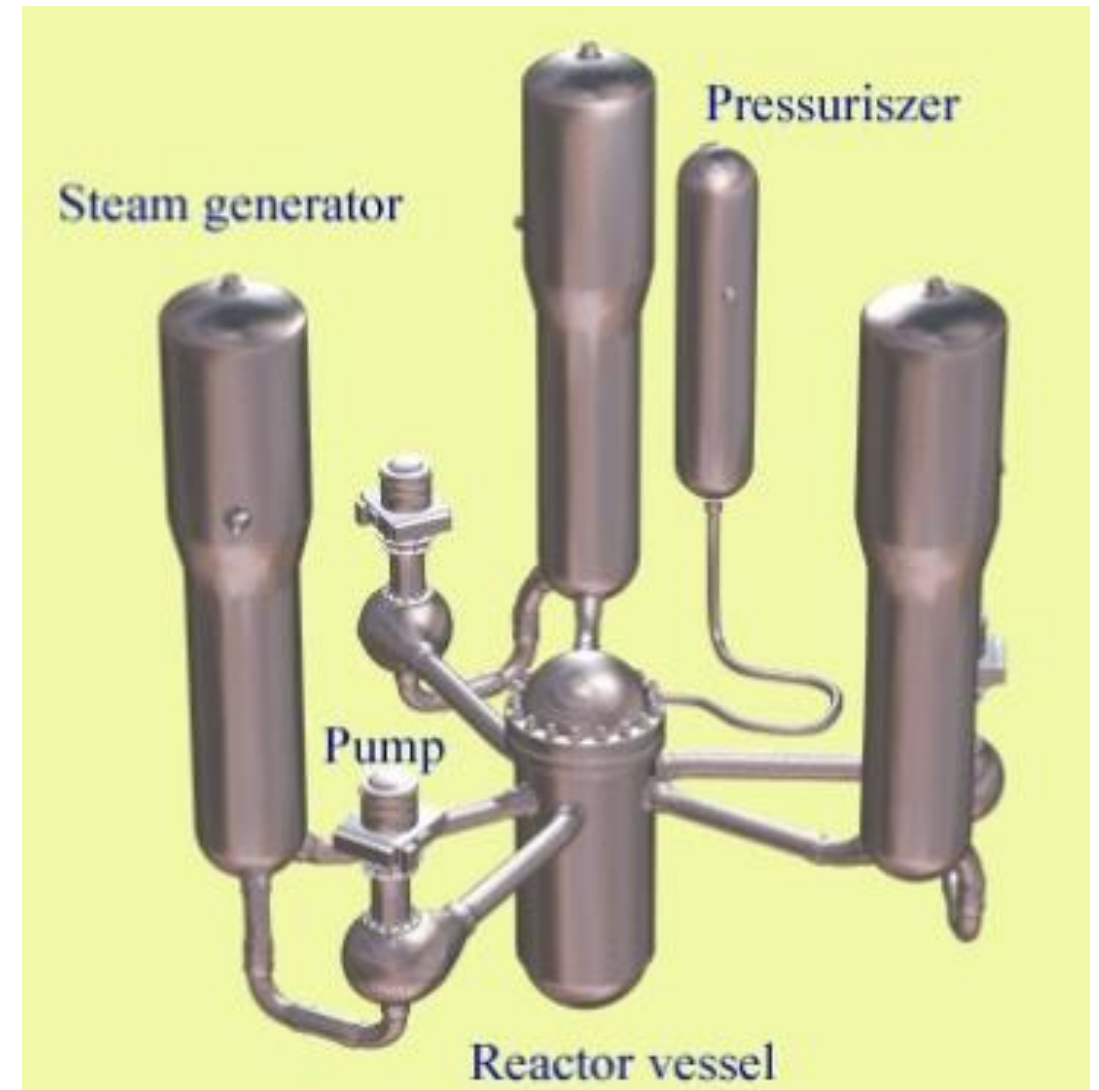
- TAC Technical Chairman
- NDE Specialist
- Contact Info.
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- ***Todd Davis, Constellation***

- TAC Technical Vice-Chairman
- NDE Specialist
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- ***Robert Grizzi, EPRI***

- MRP Inspection TAC Project Manager
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# Inspection TAC Membership

Name	Company	Role
Salem Almheiri	Nawah Energy Company	Alternate
Toru Oumaya	The Kansai Electric Power Co., Inc.	Primary
Joshua Baldock	EDF Energy Nuclear Generation, Ltd.	Primary
Justin Bozic	Nuklearna Elektrarna Krsko	Alternate
Dale Brown	Southern Nuclear Operating Co.	Chairman
Brandon Calvery	Tennessee Valley Authority (TVA)	Primary
Walter Chatterton	American Electric Power Company, Inc.	Primary
Todd Davis	Constellation Energy Generation LLC	Vice Chairman
Rachel Doss	Duke Energy Carolinas, LLC	Alternate
David Duxbury	Rolls-Royce Submarines Limited	Primary
Aaron Guckenberger	Northern States Power Company (Xcel)	Alternate
Kresimir Gudek	Nuklearna Elektrarna Krsko	Primary
Matija Gulis	Nuklearna Elektrarna Krsko	Alternate
Alan Guy	Kernkraftwerk Beznau	Primary
Kevin Hacker	Dominion Energy, Inc.	Primary
Hirofuka Isomi	The Japan Atomic Power Company	Primary
Ola Johansson	Ringhals AB	Primary
Brian Kandell	Duke Energy Carolinas, LLC	Primary
Christopher Koehler	Xcel Energy Services, Inc.	Alternate
Bradley Langston	Southern Nuclear Operating Co.	Alternate

- 46 Total TAC Members
  - 20 US / 26 International
  - 48% / 57%
- 32 Utilities Represented
  - 15 US / 17 International
  - 47% / 53%

Name	Company	Role
Cristina Ledesma	Iberdrola Generacion Nuclear S.A.U.	Primary
Taehun Lee	Korea Hydro & Nuclear Power Co., Ltd.	Primary
Wei Liu	CNNP Nuclear Power Operations Research Institute, Ltd.	Alternate
Bruno Lopes	Eletronuclear S.A.	Primary
Scott Malec	PSEG Nuclear, LLC	Primary
Randal McGaha	Entergy Operations, Inc.	Primary
Jay Miller	Constellation Energy Generation LLC	Alternate
Nicholas Morgan	Pinnacle West Capital Corporation	Primary
Joshua Morton	Vistra Corp.	Primary
Naoki Nakamura	Kyushu Electric Power Co., Inc.	Primary
Ryo Nakazaki	The Kansai Electric Power Co., Inc.	Primary
Toshiya Akiyama	Shikoku Electric Power Co., Inc.	Primary
Michael Parrott	Rolls-Royce SMR Limited	Alternate
Damon Priestley	Tennessee Valley Authority (TVA)	Alternate
Matthew Ralstin	Luminant Generation Company, LLC	Primary
Robson Santos	Eletronuclear S.A.	Alternate
Donna Slivon	Florida Power & Light Co.	Primary
Sean Smith	Nawah Energy Company	Primary
Jason Swan	Rolls-Royce SMR Limited	Primary
Sam Tulloch	Rolls-Royce Submarines Limited	Alternate
Ryo Watanabe	Shikoku Electric Power Co., Inc.	Alternate
Mike Wetteland	STP Nuclear Operating Company	Primary
Jerry Wren	Xcel Energy Services, Inc.	Primary
Cheng Yang	Research Institute of Nuclear Power Operation	Primary
Keisuke Kondoh	Hokkaido Electric Power Co., Inc	Primary
Akira Yamazaki	Hokkaido Electric Power Co., Inc	Alternate



# 2024 Inspection TAC Deliverable Review <For Reference>

# 2024 Deliverables (1/3)

## ■ MRFA 1 – Internals Management

- MRP In-Vessel Inspection (IVI) Training Course, [July 9 – 11 \(Product ID: 3002028697\)](#)
- (2) NRC Specific MRP In-Vessel Inspection (IVI) Training Courses, [July 15 – 19](#)
- Virtual Reality (VR) and Desktop Application for PWR Internals: Production Version release, [December 2024](#)
- PWR WEC 4-Loop Containment VR Simulation, [October 2024 \(Product ID: 3002029378\)](#)

# 2024 Deliverables (2/3)

## ■ MRFA 3 – Nickel-base Alloys

- Wet and adjustable Leak Path specimens (quantity 3 to 4) – Final 2 specimens
- CRDM UT Inspection Data AI Comparison Tool, December 2024
- CRDM UT Inspection Data Essential Variables AI Validation Tool, December 2024
- Complete NSSS supplier analysis of bounding Core Barrel designs (PWROG and EPRI)
- Begin fabrication of Core Barrel demonstration specimens (prioritizing plants with nearest-term inspection dates based on interim guidance implementation)

# 2024 Deliverables (3/3)

## ■ MRFA 5 – Fatigue

- MRP-23, **Revision 4** - “Materials Reliability Program: NDE Technology for Detection of Thermal Fatigue Damage in Piping”; **Product ID: 3002023884 – Delayed until 2025 due to technique development and validation**
- Open/Practice specimens for thermal fatigue damage locations applying WOL mitigation – **Fall 2024**
- (2) R&D Socket Weld UT Technique Development specimens – **November 2024**

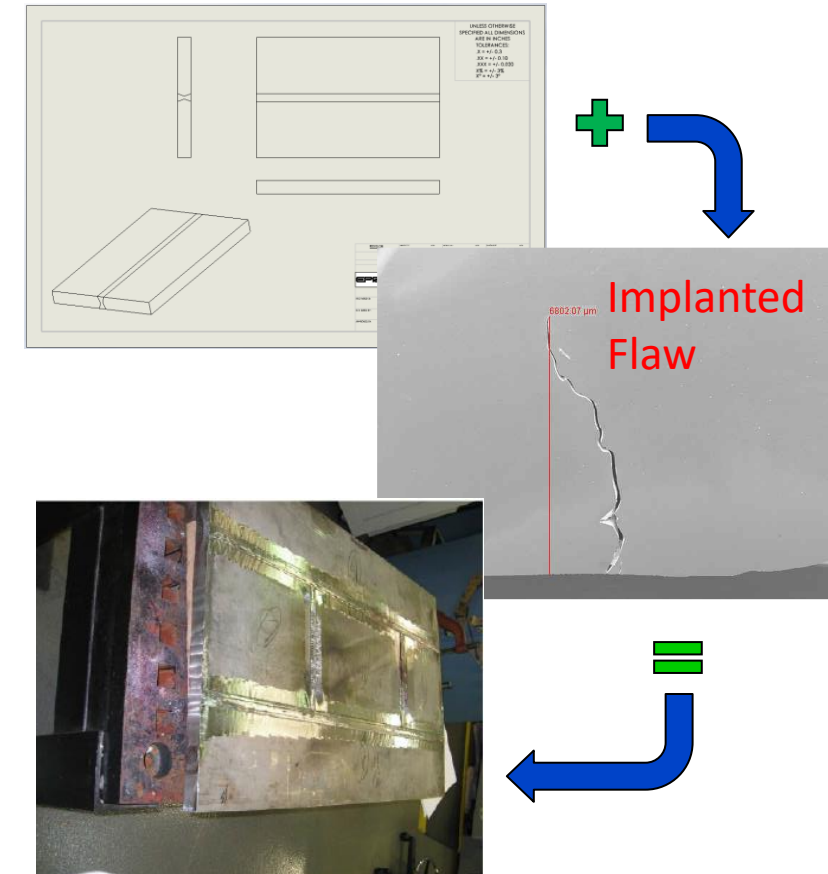


# Key Technical Topics

# Key Technical Topics – Inspection TAC

- MRFA 1 – RPV Internals Management
  - Core Barrel Interim Guidance Inspections
    - Design and development of open and blind test specimens
    - Development of demonstration / qualification protocol for the industry
  - Remote visual inspections
    - Continued development and implementation of VT AI
    - Continued development of EVT-1 efficiency based on technology advancements
  - IVI Course scheduling, Summer and Winter of 2025

Core Barrel UT Specimen Design



# Key Technical Topics – Inspection TAC

- MRFA 3 – Nickel-bases Alloys
  - Support and collaboration with Ringhals qualification of AI for RVUH ultrasonic exams
  - Enhancements to RVUH ultrasonic examination AI model and tools
    - Coverage calculations
    - Previous outage data comparison
    - Essential variables checks
  - Review of MRP-384 “Guideline for Nondestructive Examination of Reactor Vessel Upper Head Penetrations” scheduled for 2025 – potential for adding guidance for implementing AI.

# Key Technical Topics – Inspection TAC

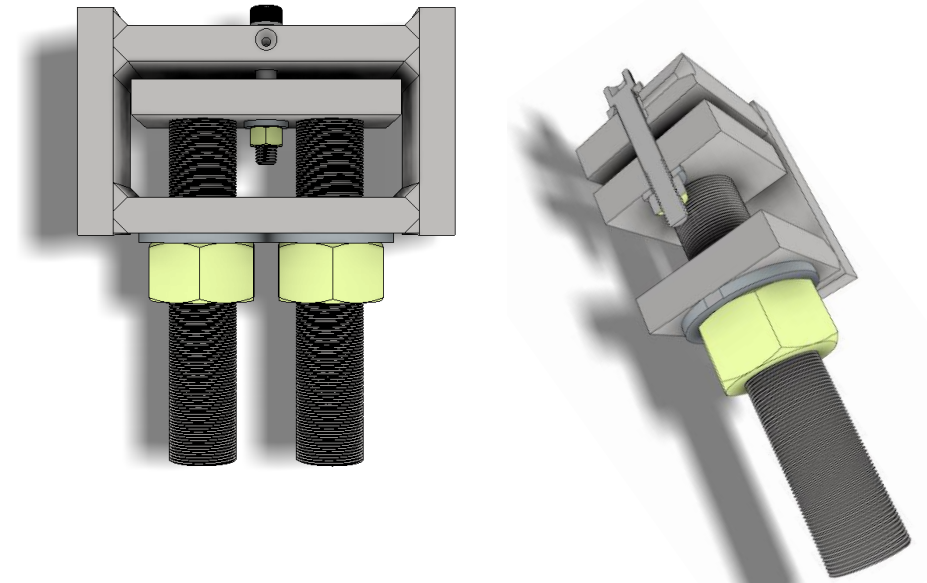
- MRFA 5 – Fatigue
  - Development of PAUT procedures to support WOL mitigation of TF locations
  - Continued research on UT technique development for characterization of socket weld flaws / indications
    - Test plate fabricated
    - New probes ordered
  - Updates to MRP-23, MRP-36, & MRP-350 will need to follow the two activities above, may include new or updated MRP UT procedures



# New Projects - 2025

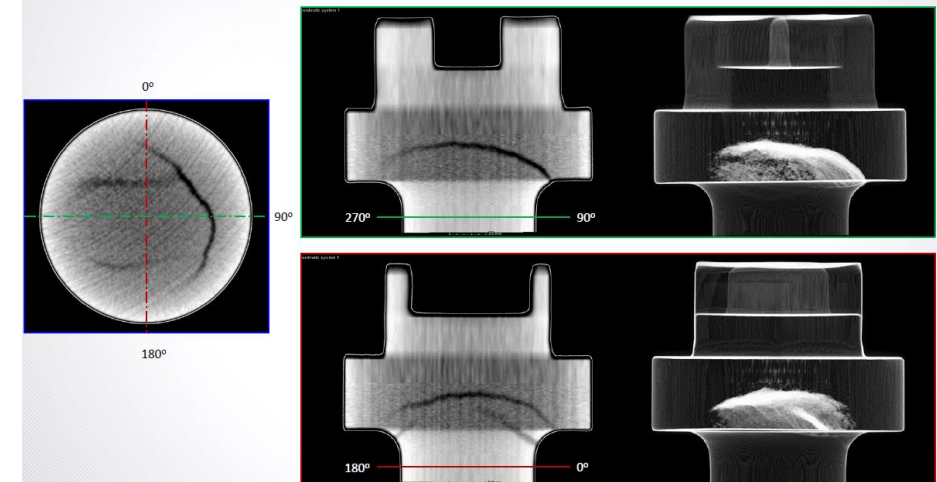
# New Projects for 2025 (1/2)

- Reactor Internals Bolting – research and experiment with creating SCC flawed specimens
  - Provide the industry with a means to scan bolts that are acoustically very similar to the various in-vessel bolt configurations, which have actual SCC flaws.
  - Potential to integrate with current bolting protocol specimens
  - Potential to aid in NDE technique development



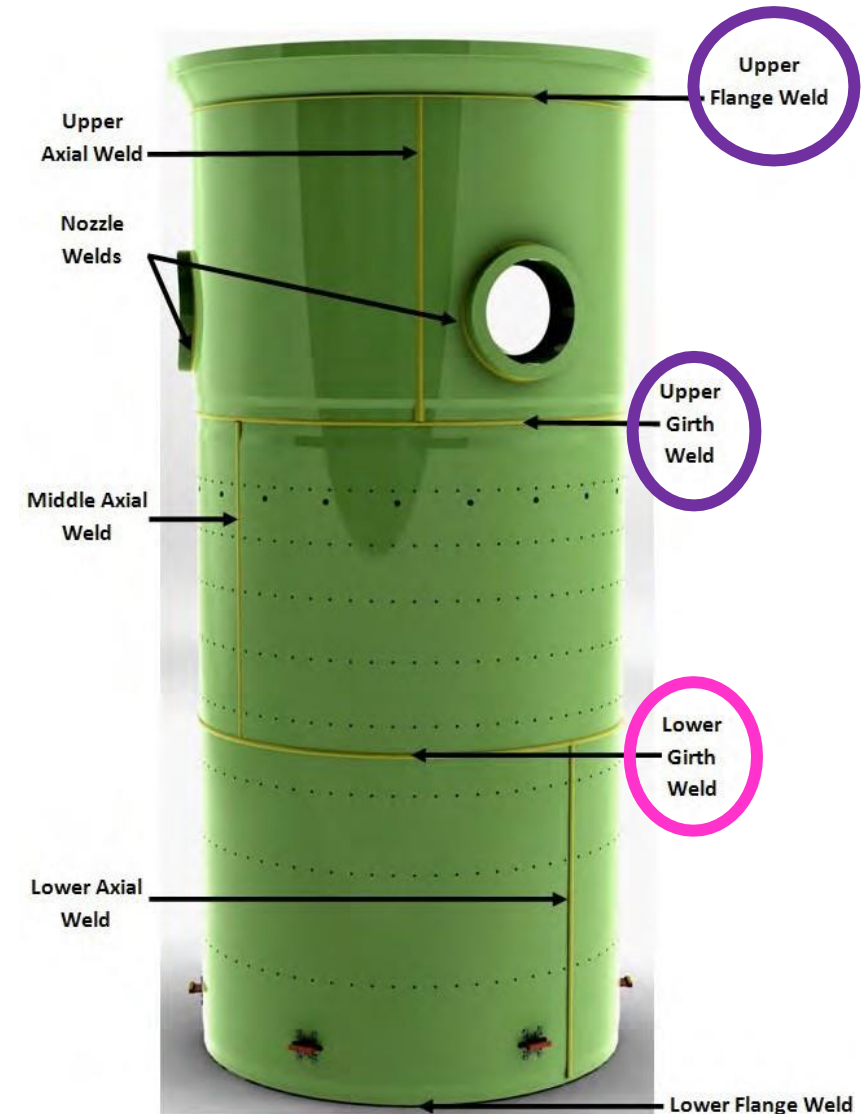
## 2D-3D Tomography (X-ray CT)

- X-ray CT performed on the bolt with indication A15



# New Projects for 2025 (2/2)

- Development of Core Barrel UT protocol for demonstration / qualification
  - Procedure qualification will be open, but needs 100% detection and no false calls
  - Personnel qualification will be blind
    - Level of rigor, POD, and flaw size/distribution all **still under consideration**
  - Vendors will be responsible for appropriate technical justifications
  - Acceptance of qualification and technique technical justifications will be the onus of the utility





# Questions / Discussion



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