

EPRI NDE Research for Balance of Plant Components



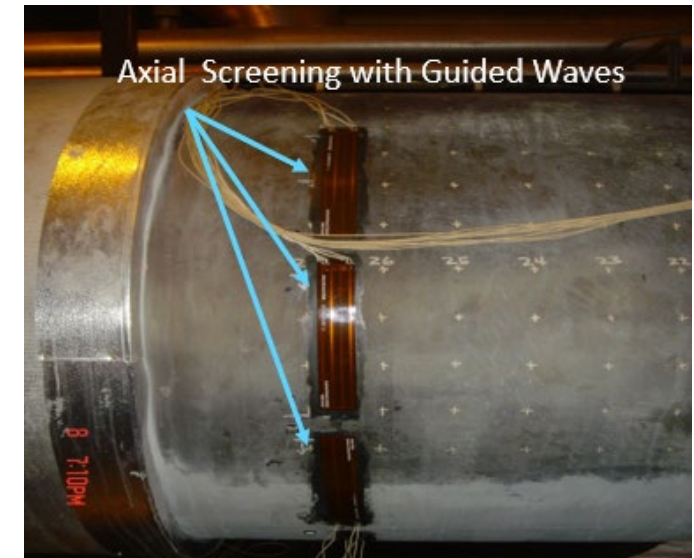
Sam Johnson
Principal Team Lead

2026 NRC NDE Technical Information Exchange Meeting
1/22/26

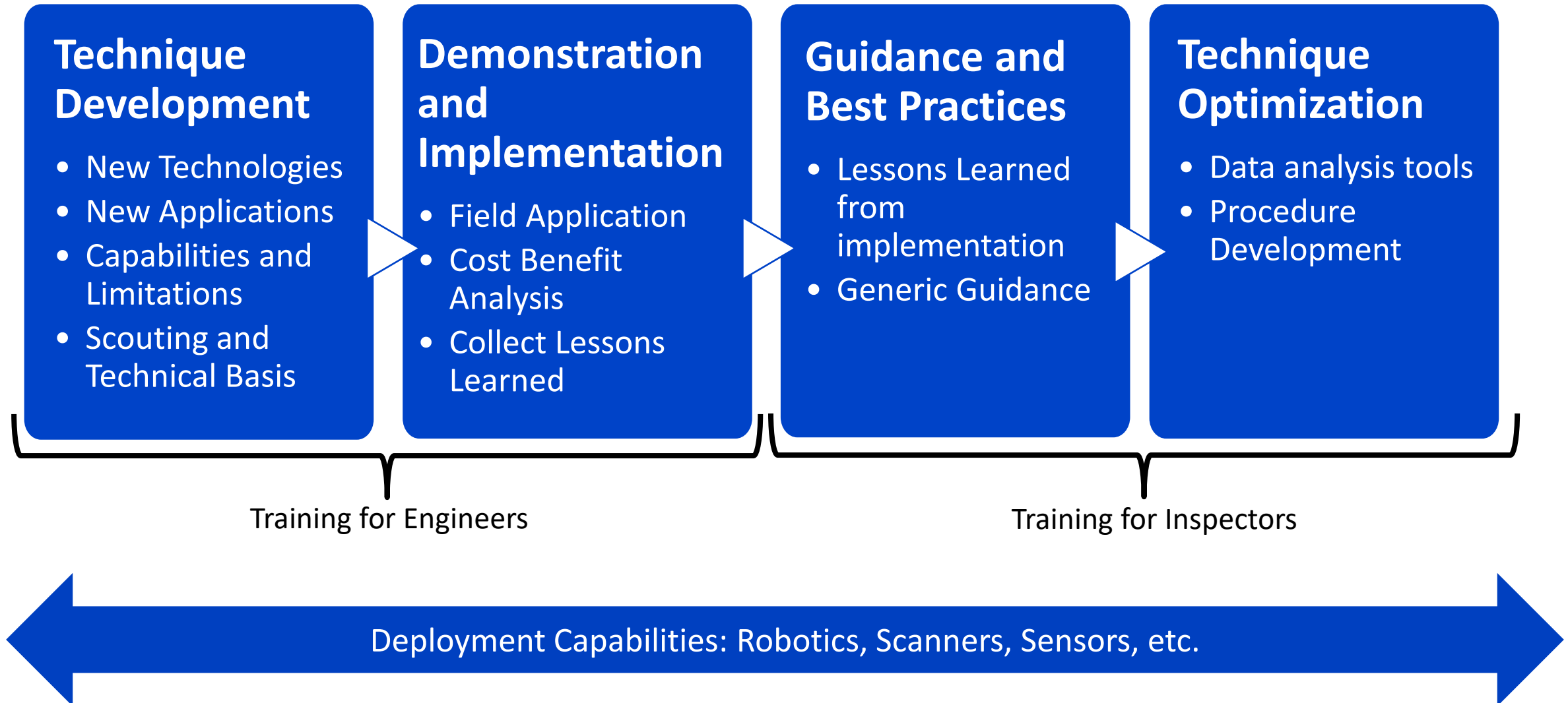
Scope of EPRI Balance of Plant NDE Research at EPRI

- Components of Interest include:
 - Buried Piping
 - Service Water Piping
 - Heat Exchangers
 - Civil Infrastructure
 - Liners
 - Non-nuclear piping components
 - Turbines
 - Renewables Assets

**Researching Capabilities, Limitations,
Providing Guidance for Implementation, and
Delivering Training**



BOP NDE Process





Balance of Plant Related NDE Projects

2025 Deliverables

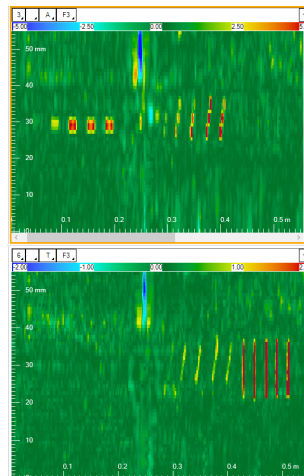
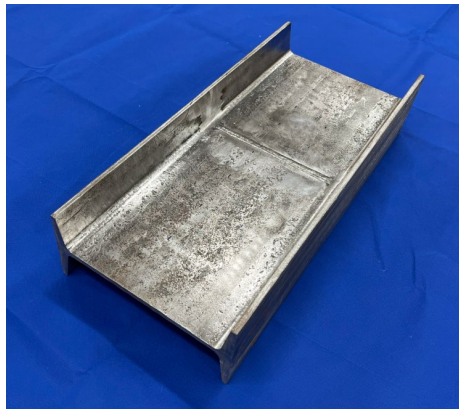
Deliverable #	Title
3002032177	Assessment of Electromagnetic NDE Techniques for Raw Water Piping
3002032183	Guidance and Assessment of Guided Wave Examination of Service Water Piping
3002032154	NDE Performance Characteristics for Carbon Fiber Reinforced Polymer Repair Structures
3002032105	Eddy Current Array Inspection Techniques for Testing Ferromagnetic Materials
3002032251	Tank Inspection NDE Database (Beta)



3002032105 - Eddy Current Array Testing for Ferritic Materials

Project Objective & Scope

- Project Objective
 - Investigate the ECA technique that can perform a reliable surface and weld inspection for ferritic and/or ferromagnetic steels, and assess the defect characterization capability
- Project Scope & Approach
 - Targeting the ECA methods on multiple ferritic and ferromagnetic flaw specimens to understand the technique's capability and limitations on flaw detection, characterization, and depth sizing



3002032183 – Guidance and Assessment of Guided Wave Examination of Service Water Piping

Project Objective & Scope

- Identify and evaluate guided wave technology for inspection of service water piping
 - Provide guidance for utility personnel overseeing inspections
 - Evaluate Quantitative Short-Range GW tools



EPRI



2025 TECHNICAL REPORT

Guidance and Assessment of Guided Wave Examination of Service Water Piping

Balance of Plant Related NDE Projects

2026 PROJECTS



Remote Thickness Measurements

Advanced UT Development for CFRP

Tube Sheet Plate Degradation Evaluation with AC Array

Update HX Tubing Degradation Database

Guided Wave Examination of Storage Tanks

Quantification of Corrosion with Guided Wave

Gridding, UT and Component Location Using Augmented Reality

Tank Inspection Reference Guide

NDE Technologies for Pipes at Penetrations

NDE for Selective Leaching

UT in Lieu of RT Activities

Capability Demonstration

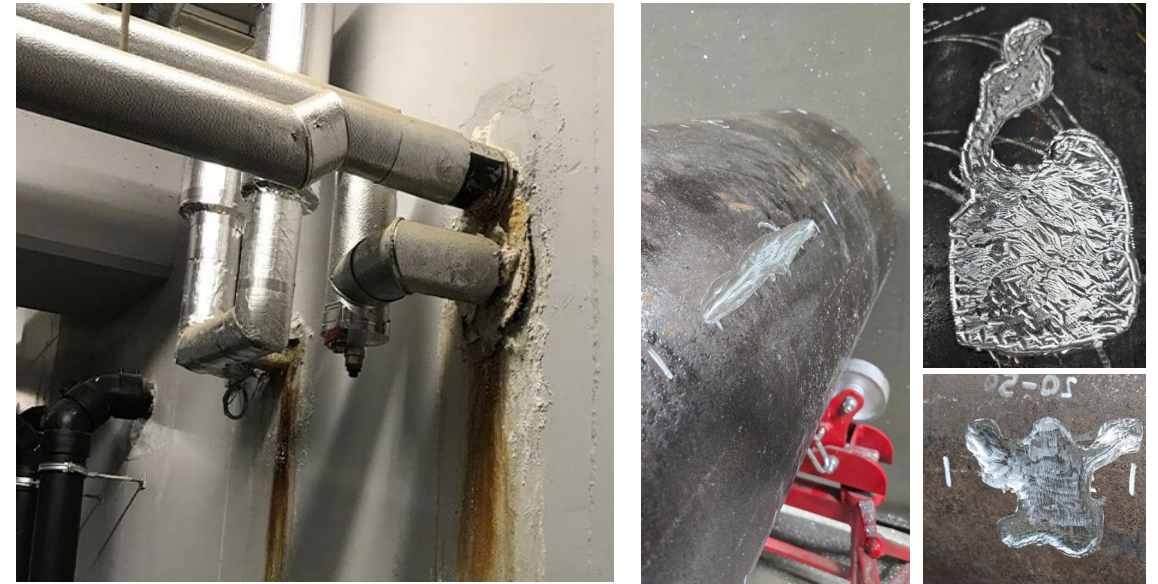
NDE Techniques for Pipes at Penetrations and Inaccessible Areas

Project Objective & Scope

- Project Objective
 - Recent OE has shown a need for NDE inspection techniques to detect corrosion and other degradation in pipes at penetrations and other inaccessible areas.
- Project Scope & Approach
 - Investigate advanced Guided Wave and Shear Wave methods to detect defects in inaccessible regions of a pipe and concrete NDE techniques to detect corrosion in pipes

Deliverable and Collaboration

- Project will deliver the following reports:
 - Technical Report December 22, 2026
 - Pipe Penetration mockups, that can be used by all members for technique development and training
- Support / Collaboration
 - Conducted an industry wide survey in 2024 to gain understanding of industry issues and concerns
 - MPR associated helped in developing Industry Survey and Industry configuration guide



Schedule & Upcoming Work

- Project Schedule
 - Industry wide pipe penetration Survey 2024
 - Industry configuration guide 2025
 - Manufacture 5 Pipe Penetration mockup (Complete Oct 2025)
 - Technique development Q3 through Q1 2026
 - Expected Completion December 2026

Guided Wave External Examination of Storage Tanks

Project Objective & Scope

- Develop guided wave technology for imaging of corrosion for walls and floors of storage tanks
 - Demonstrate and measure capabilities on mockups with industry configurations and flaws of interest

Deliverable and Collaboration

- Technical Report with demonstration of technology on storage tank mockups
- Support / Collaboration
 - Workshop conducted at NDE Tech Week in 2023
 - Working with vendors on identifying equipment requirements and needs for data acquisition and guided wave imaging capabilities



Schedule & Upcoming Work

- Completed 16 channel FMC GW system
- Completed software interface control
- Completed high frequency array designs
- Dec 2025 – Complete arrays
- Aug 2026 – Complete testing on mockups
- Final Report Deliverable: Dec 2026

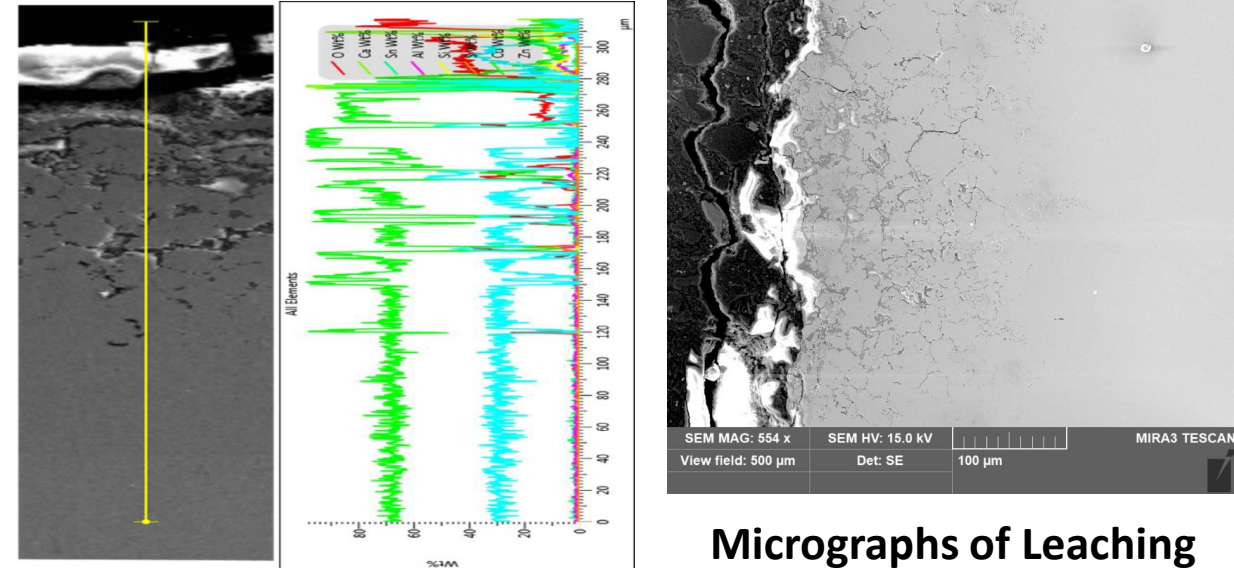
NDE for Selective Leaching

Project Objective & Scope

- Project Objective
 - Investigate eddy current inspection technique(s) to detect, characterize, and quantify selective leaching in 90/10 CuNi and Admiralty Brass tubes.
- Project Scope & Approach
 - Eddy current bobbin and combination array probes will be used to investigate leaching and other tubing damage.

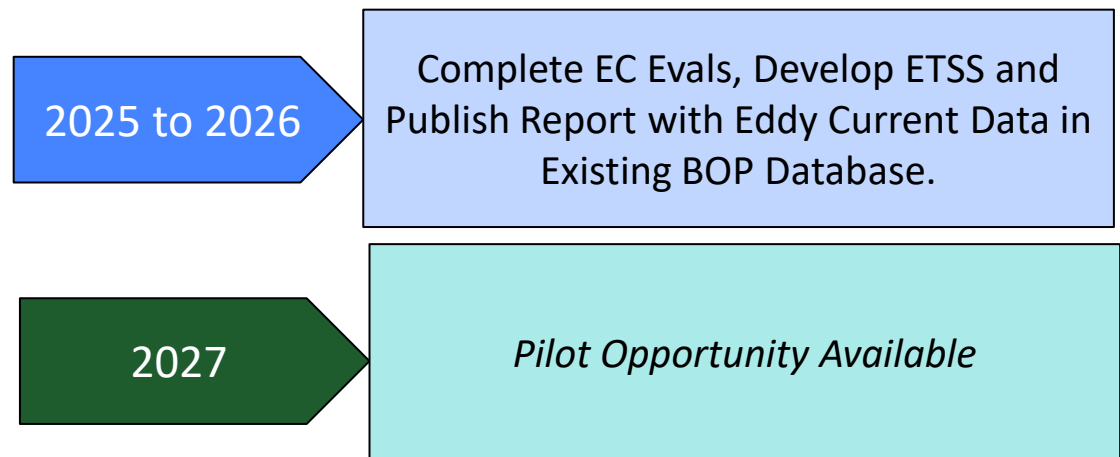
Deliverable and Collaboration

- Project will deliver the following reports:
 - **Eddy Current:** Examination Specification Technique Sheet (ETSS), Final Report, and Eddy Current Data will be electronically available to members via an existing BOP Eddy Current Database – December 2026
- Support/Collaboration:
 - Czech Republic
 - PSEG
 - EPRI's PRR Program (HXPUG) & BOP HX NDE Focus Group



Micrographs of Leaching

Schedule & Upcoming Work





TOGETHER...SHAPING THE FUTURE OF ENERGY®