

Overview of the EPRI NDE Program 2025 Workplan

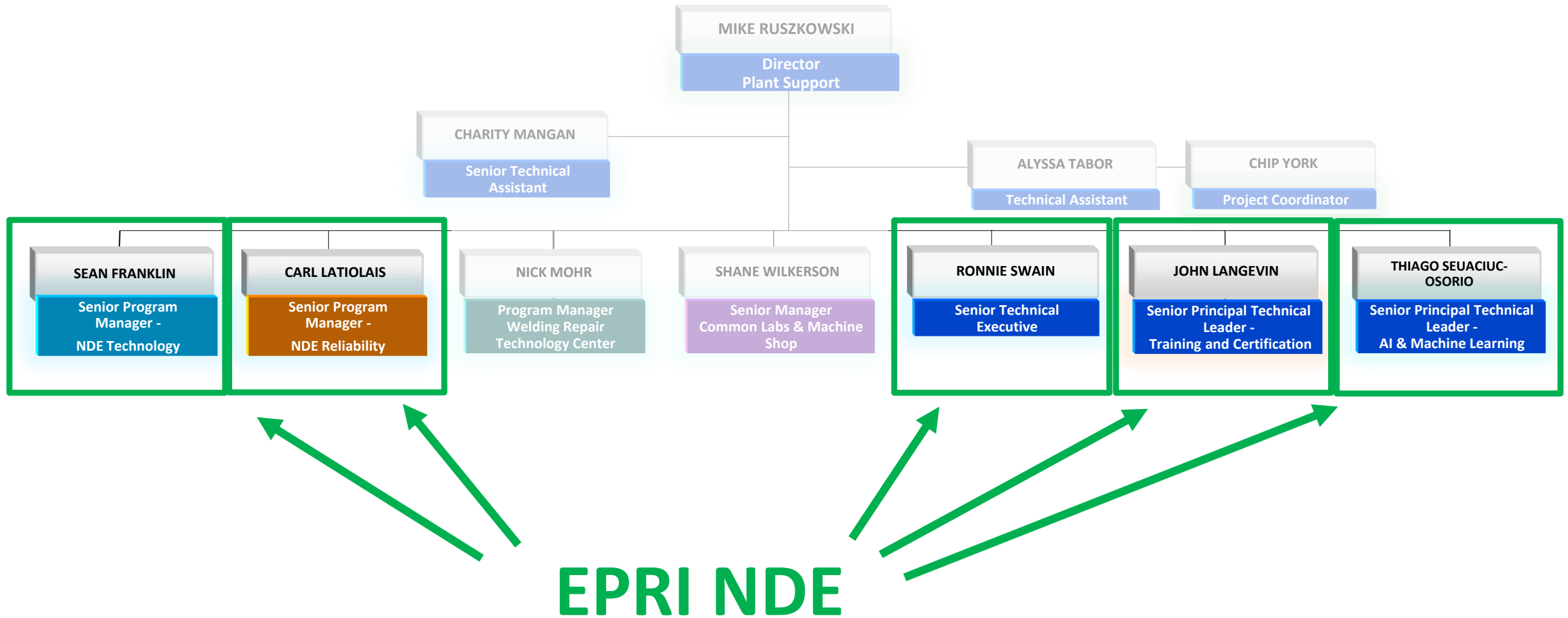
A graphic on the right side of the slide featuring a blue rounded rectangle with a white border. Inside the rectangle is a blue square with the word "Nuclear" in white text. Above the blue square is a grayscale image of a nuclear reactor core.

Nuclear

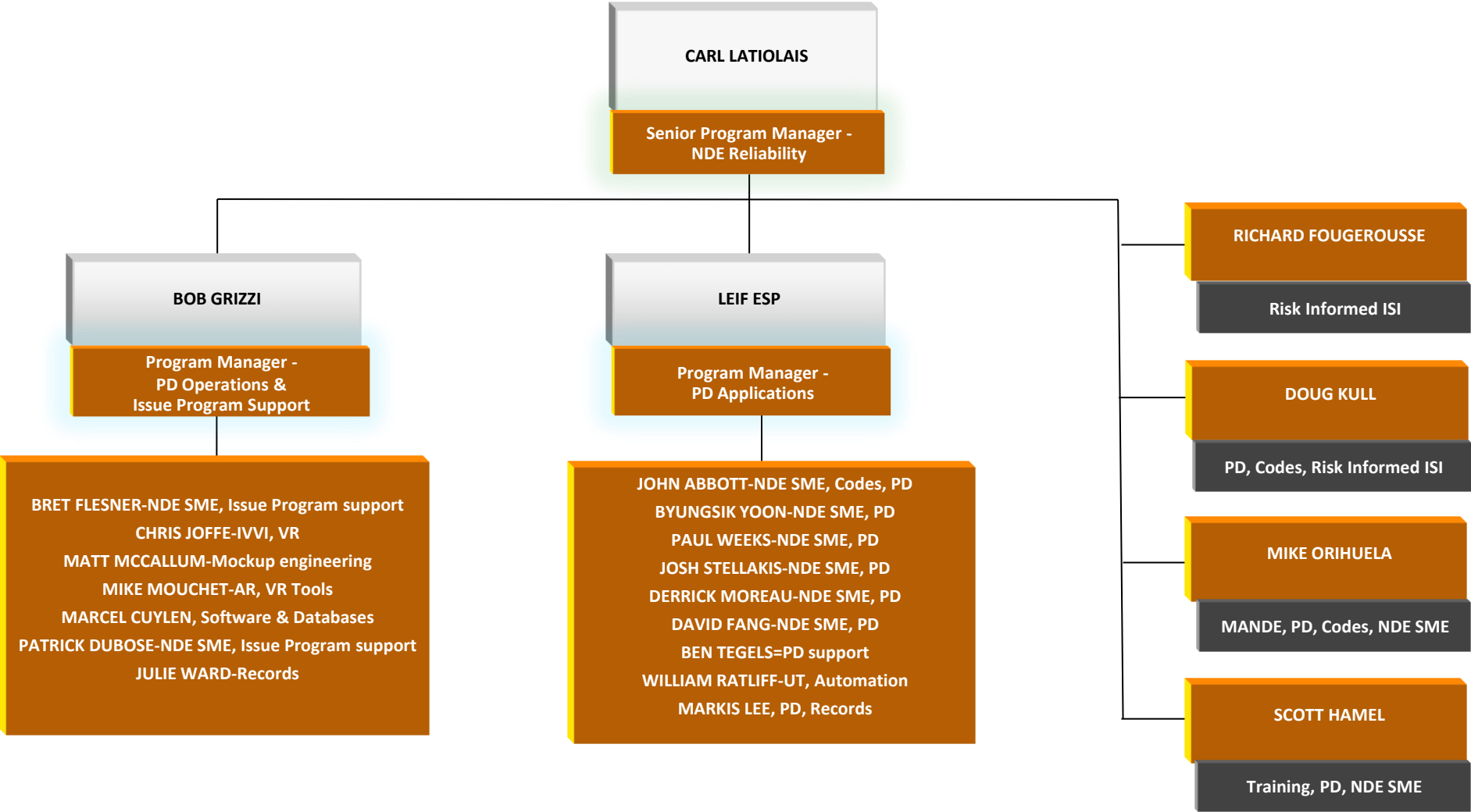
Ronnie Swain
Senior Technical Executive – EPRI

NRC-Industry NDE Technical Information Exchange Meeting
January 22, 2025

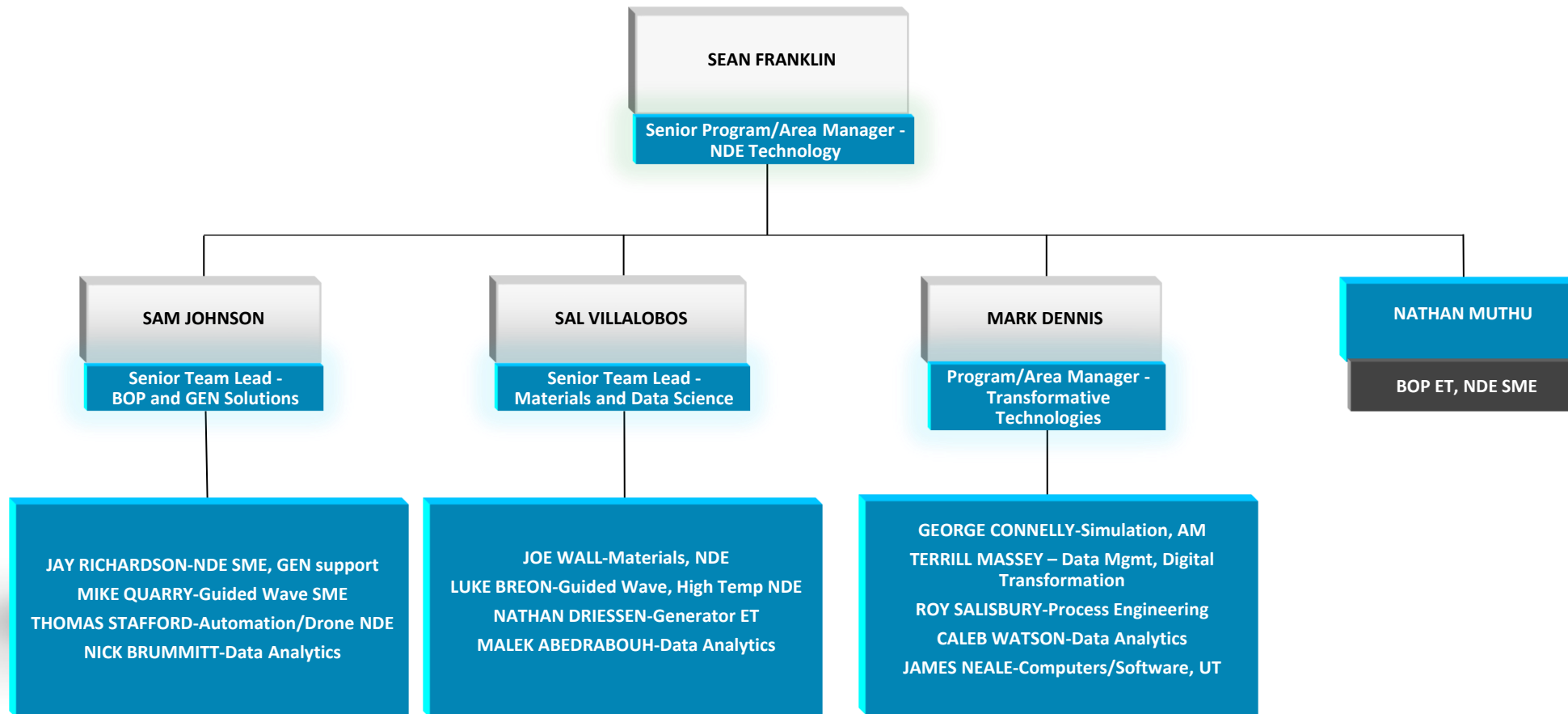
EPRI Plant Support Department



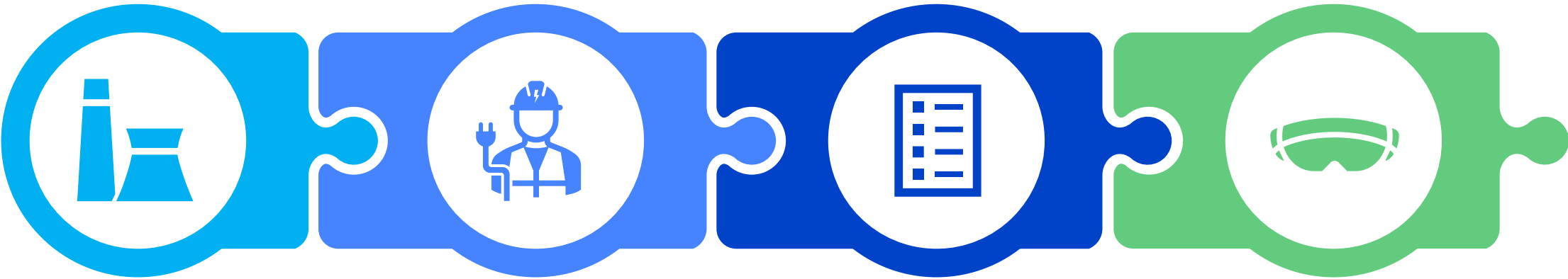
NDE Reliability Programs



NDE Technology Programs



Overarching Drivers of Our Research



Fleet / Components

- Research for Current and Future Nuclear Fleet
- Solutions for Primary Systems and Balance-of-Plant
- Guidance for Aging Management/License Renewal
- Risk-Informed Approaches to Inservice Inspection

People

- World Class Training for All Stakeholder Needs
- Robust Qualification and Certification Programs
- Technology & Guidance to Improve Performance
- Real time Support for Emergent Issues

Process

- Collaboratively-Developed Guidance & Procedures
- Data Analytics Research for Real-Time NDE
- Leadership & Advocacy for Codes and Standards
- World Class Performance Demonstration Program

Technology

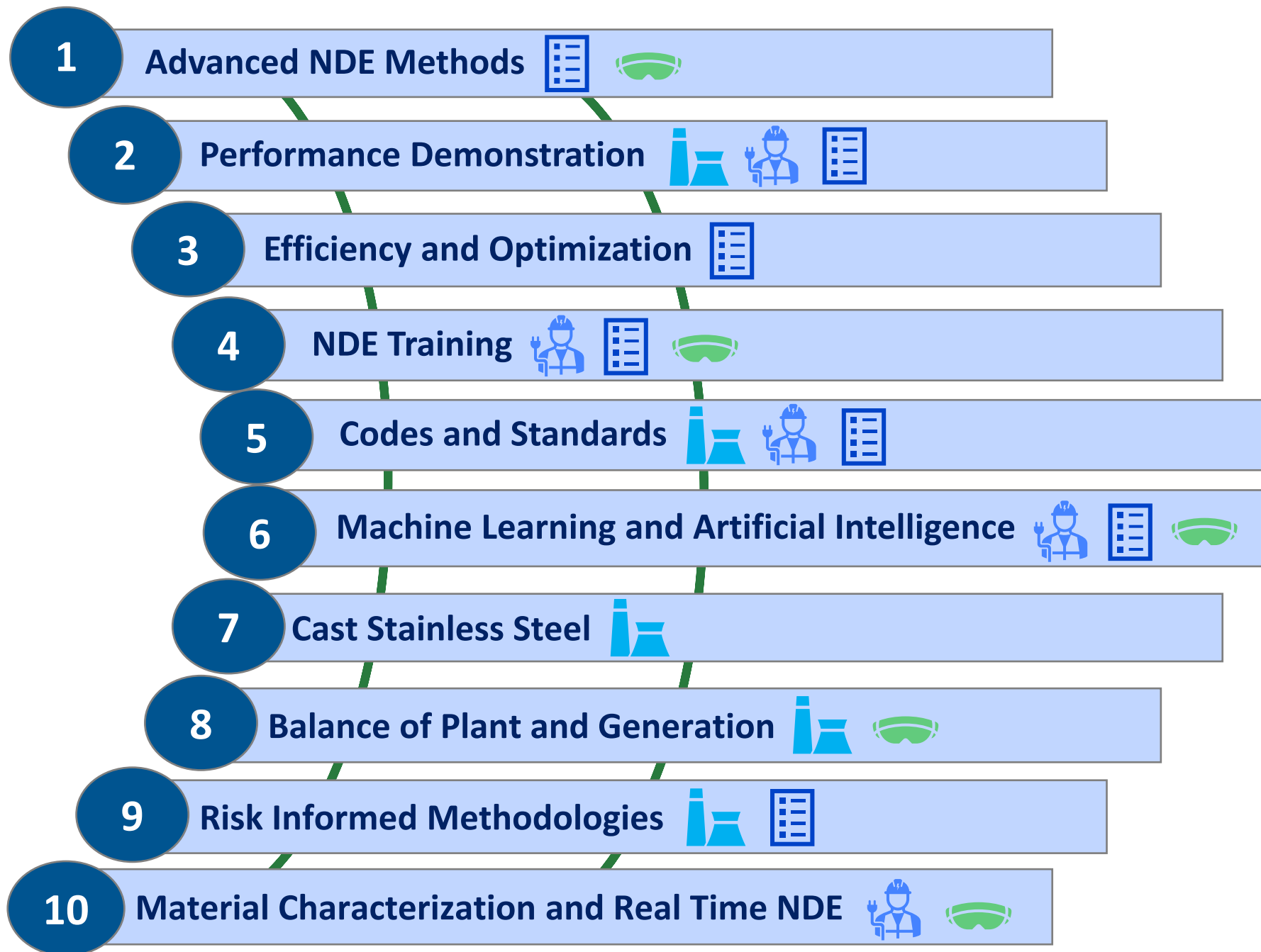
- Advanced Acquisition Systems & Robotics
- AI & Machine Learning for Efficiency and Reliability
- Advanced Sensors for Extreme Conditions
- Augmented and Virtual Reality Tools

Higher Level Themes Interspersed Throughout the NDE Research Focus Areas

NDE

10 Research Focus Areas

~70 Research Projects Annually



Advanced NDE Method Projects

EPRI UT Simulator Update – Phased Array

Mark Dennis

Ultrasonic Noise Reduction for Enhanced Flaw Detection

Terrill Massey

ET Array Development for Control Blades

Byungsik Yoon

Expansion and Refinement of Virtual Mockup Capabilities*

Leif Esp

Remote Thickness Measurement in Locations with Low Accessibility

Byungsik Yoon

*Bolded projects will be presented later on the agenda

Performance Demonstration Projects

Appendix VII and VIII Hands-On Practice Utilizing the UT Simulator	Leif Esp
Guideline for Conducting Lab Time for Nuclear UT Experience Hours	Paul Weeks
Industry Phased Array Procedure Implementation Enhancements	Paul Weeks
AI Qualification Protocol	Derrick Moreau
Performance Demonstration Implementation Tools	Paul Weeks
Formalize and Modernize Performance Demonstration Training	Paul Weeks

Efficiency and Optimization Projects

EVT-1 Efficiency Study

Chris Joffe

Database of Examination Procedures and License Renewal Commitments

Bret Flesner

Technical Bases for Optimization of Examination Requirements

Bob Grizzi

UT Data Archival and Retrieval Tool

Terrill Massey

Old Reports - New Format

Scott Hamel

Cost Benefit of UT in lieu of RT

Sam Johnson

Gridding, UT, and Component Location Using Augmented Reality

Sal Villalobos

NDE Training Projects

CBT for Surface Eddy Current Array Testing*

Nathan Muthu

UT Level I Course

Scott Hamel

Knowledge Transfer on Interdependence of Welding/Fabrication and NDE

Bret Flesner

CBT for ASME Section XI "Specific Course" for Level III Certification

John Langevin

CBT Basic Course for Level III Certification

John Langevin

CBT for Time-of-Flight-Diffraction

John Langevin

CBT for Through-Wall Sizing Using the Simulator

Scott Hamel

ET Level I, II, and III Training Courses

Nathan Muthu

CBT for Advanced Remote VT

Chris Joffe

Codes and Standards Projects

ASME Code Development

Mike Orihuela

Ultrasonic Examination Coverage Estimation Tool

Doug Kull

Technical Basis for Flaw Evaluation Inputs

Bret Flesner

Assessing the Reliability of AI-Assisted NDE

Thiago Seuaciuc-Osorio

Machine Learning and Artificial Intelligence Projects

AI Analysis for Core Shroud and Core Barrel UT	Thiago Seuaciuc-Osorio
EPRI NDE Assistant and NDE website	Mark Dennis
Rule-Based Assisted Analysis of UT Data	Mark Dennis
AI-Assisted Analysis for UT of In-vessel Piping Components	Thiago Seuaciuc-Osorio
Benchmarking Tools for AI Solutions	Thiago Seuaciuc-Osorio
Harnessing ML to Improve ET Flaw Characterization and Depth Sizing	Nathan Muthu

Cast Stainless Steel Projects

Advance Ultrasonic Techniques for Cast Austenitic Stainless-Steel Materials Mark Dennis

Cast Stainless Steel Performance Demonstration Program Development Carl Latiolais

Balance-of-Plant and Generation Solution Projects

NDE of Carbon Fiber Reinforced Polymer (CFRP) Integrity

Luke Breon

Service Water NDE Reference Guide – Part II

Sam Johnson

Guidance for Guided Wave Examination for Service Water Piping

Mike Quarry

Eddy Current Array Testing for Ferritic Materials

Byungsik Yoon

Tube Support Plate Degradation Evaluation with Eddy Current Arrays

Nathan Muthu

Qualified ET Tubing Examination Specification Technique Sheet Program

Nathan Muthu

Assessment of UT Roller Technique for Concrete Structures

Sal Villalobos

NDE Techniques for Pipes & Penetrations in Inaccessible Areas

Thomas Stafford

Tank Inspection Reference Guide

Sam Johnson

Risk-Informed Methodology Projects

Expanding EPRI RI-BER Methodology

Rick Fougrousse

Increasing Effectiveness via Enhanced Categorization Methodology

Rick Fougrousse

RPV Threads-In-Flange

Rick Fougrousse

Degradation Mechanism Eval Process CBT and Tool

Doug Kull

Material Characterization and Real-Time NDE Projects

Benchmarking of NDE for Materials Characterization Methods

Malek Abedrabouh

Fiber-Optic Sensor for Tendon Monitoring

Mike Quarry

Development and Characterization of High-Temperature UT

Luke Breon

Non-RFA-Specific Projects

Inspection Issue Support

Mike Orihuela

Long-Term Operation (LTO) Support

Sam Johnson

NDE Workforce Study

Sean Franklin



TOGETHER...SHAPING THE FUTURE OF ENERGY®