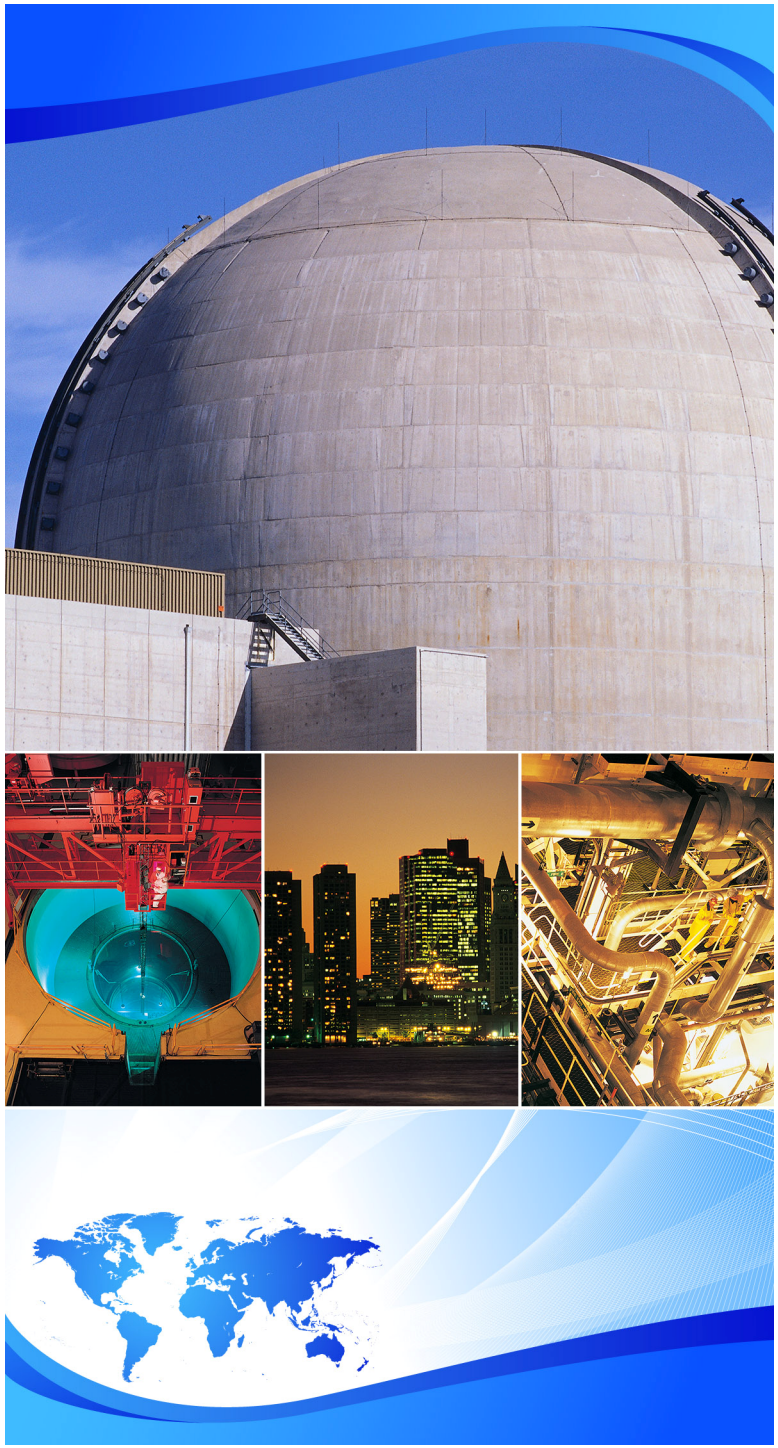

ELECTRIC POWER RESEARCH INSTITUTE

Overview of NDE Projects

NRC/PDI Meeting

May, 2009

Carl Latiolais

Senior Program Manager

Appendix VIII Performance Demonstration

Overview

- Provide listing of NDE related projects both ongoing and proposed
  - NDEC
  - MRP
  - BWRVIP
  - Technical Innovation (TI)
  - SGMP
  - ANT (New Plant)
- All projects while funded by different programs are either performed or managed by NDEC staff
- Listing does not include maintenance and operation of ongoing programs such as PDI and Training

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2009 Projects NDE Center Projects

Project	Project Manager
NDE Target Management	Greg Selby
NDE Center Publications	Greg Selby
NDE Conferences Seminars and Workshops	Greg Selby
Strategic Purchase of Capital NDE Equipment	Greg Selby
NDE Simulation Resources	Greg Selby
ASME Code Participation	Jack Spanner
NDE Issues Management Program	John Lindberg
RI-ISI Support	Pat O'Regan
Conversion of RI-ISI programs to Code Case N716	Patrick O'Regan
NDE Training Courses & Qualification Examinations	Henry Stephens
Update NDE Training Materials	Henry Stephens
PDI Maintenance	Carl Latiolais
Nondestructive Measurement of Internal Stress	Kenji Krzywosz
Guided Wave Ultrasonic Technology Applications for BOP HX Tubes & TSP Degradation	Nathan Muthu
Surface Exams of Nickel Alloy Welds	Pedro Lara
BMN NDE Qualification Program	Robert Barnes
Alloy 600 Butt Weld Support	Carl Latiolais

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2009 Projects NDEC Projects

Manual Phased Array Procedure for RPV Inspections	Sherrie Whiddon
Manual Phased Array UT Qualification for Piping Applications	Mark Dennis
Cast Stainless Steel - Evaluation Process	Patrick O'Regan
Electromagnetic NDE Guide for BOP Heat Exchangers Rev. 3	Nathan Muthu
CI-6-NDE Application to Address Groundwater Contamination Issues	Nathan Muthu
NDE Implementation Issues Associated with Aging Plants and License Renewal	Steve Kenefick
Intergrated Guided Wave Project	Steve Kenefick
NDE for Selective Leaching	Kenji Krzywosz
Condition Assessment of Buried Plant Piping	Pedro Lara
Qualification of Filmless Radiography	Mike Blanchard
Upper Head Penetration Mockups for Eddy Current Examinations	Bob Barnes
Guideline for Design of Inspectable Components for New Reactors	Carl Latiolais
Fast Track NDE Work Force Enhancement	Robert Bouck
ASME Section XI Development	Mike Gothard
Plant-Specific Applications of Qualified Nozzle Inner Radius and Nozzle-to-Shell Weld UT Procedures Using EPRI Computer Models	Doug MacDonald
Ultrasonic Instrument Equivalency Demonstration through Technical Justification	Mark Dennis
Examination of Reactor Vessel Internal Components for Stress Relaxation	Pedro Lara

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2009 Projects NDEC Projects

Validation of Single-Sided Ultrasonic Examinations for Stainless Steel	Mark Dennis
Inspection Techniques and NDE for Buried and Limited Access Components	Nathan Muthu
Remote Visual Examination Enhancements	Jeff Landrum
Appendix VIII, Supplement 12, Performance Demonstration Preparation	John Langevin
Flaw Fabrication in Cast Stainless Steel Components	Doug Kull
Optimization of UT Inspections for Piping Applications	Mark Dennis
Guided Wave Seminar	Steve Kenefick
Good Practices to Optimize Human Performance During ISI	John Langevin
Assessment of NDE Technologies and Practices in Other Industries	Steve Kenefick
Guideline Development for Above, Below Ground and Limited Access Storage Vessel Inspection	Nathan Muthu
Content Management System for EPRIQ	Craig Smith
RI Repair / Replacement	Pat O'Regan
Radiation Safety for Radiographic Operations	Mike Blanchard

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Proposed 2010 NDEC Projects

Eddy Current Sizing_2010-2012	Krzywosz
Examination for Selective Leaching_2010-2012	Krzywosz
Advanced NDE for Testing Duplex and Ferritic Tubing Material	Muthu
EC Sensor Evaluation for Circ Cracks at Expansion Joints_rev0.xls	Muthu
NDE for Transfer Canal Inspection_rev0.xls	Muthu
007_NM_GWater-RFT Technology Assessment_rev0.xls	Muthu
Validation of Vacuum Box Technology	Muthu
Evaluation of Electromagnetic Techniques for Cast Stainless Steel Pipe Weld Inspection-2010	Dennis
Evaluation of Inside Surface Examination Techniques for Cast Stainless Steel Components-2010	Dennis
PWR Stress Corrosion Cracking in Stainless Steel NDE Feasibility-2010	Dennis
Signal Processing Advancements for Cast Stainless Steel UT Examinations-2010	Dennis
Buried Pipe NDE Recommendations Document	Kenefick
LR Best Practices	Kenefick
NDE_Data Conversion and Storage.xls	Smith
HDPE Inspection Techniques and Assessment	Parsnow
Laser Beam for Dimensional and NDE Examinations	Barnes
Alloy 600 Butt Weld Mitigation technique - Outside Diameter Inlay	Grizzi
Ultrasonic Cable Equivalency Phase 2	Kull
Written qualification exam database	Langevin
PDI practice sets for DM, WOR and Piping	Langevin
Develop new infrastructure for Training material delivery	Stephens
Low frequency UT for Weld Overlay on the Cast Stainless Steel	Sekinuma

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MRP NDE Projects

Baffle Bolts	Spanner
Bolt Stress Relaxation	Spanner
Visuals VT-1 and Enhanced Visual & Wear	Spanner
IASCC Baffle & Former Plates	Spanner
IVVI Course Development	Spanner
NDE Accessibility: Reactor Internals	Spanner
NDE Method for Void Swelling Identification & Characterization	Spanner
Collect Database and Perform Experiments	Spanner
Develop NDE Techniques for Baffle Plate Inspection	Spanner
Sub-Task 1: Mockup of Baffle Plate for IASCC Cracking	Spanner
Sub-Task 2: Development of GW System for IASCC Crack Detection and Isolation	Spanner
Sub-Task 3: Field Trial of GW System	Spanner
I&E Guidance for BMNs	Spanner
BMN Demonstration Program	Spanner
Peening and Surface Mitigation Technlogies Qualification for BMNs	Spanner
RPV Upper Head Qualification Program	Spanner
RPV Upper Head NDE Technique Development	Spanner
Upper Head Penetration Mockups for ECT Examinations	Spanner
Leak Path Assessment	Spanner
NDE Technology: Overlay Exam Qualification	Spanner

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BWRVIP NDE Projects

- Ongoing BWRVIP projects include support of BWRVIP-03 demonstrations and publishing of results
- IVVI Training Courses
- BWRVIP also has NDE target budget to work on items directed by its steering committee

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Technical Innovation (TI) NDE Projects

- Funded

Motion Tracking by Optic Flow Analysis	Mark Dennis
Detection of Early Stage Cracking, Creep	Joe Wall
NDE for Buried Piping	Mike Quarry
NDE for Cast Stainless Steel	Mark Dennis
NDE for Concrete	Joe Wall
3D Profilemetry Acquisition Scanning System (3D PASS)	Robert Grizzi

- Proposed

Realtime NDE for Welding	Jack Spanner

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ANT (New Plant) NDE Related Projects

- Existing Projects

NDE and Reduction of Repairs in Nuclear Construction	Steve Swilley

- Proposed Projects

NDE and Reduction of Repairs in Nuclear Construction	Steve Swilley

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SGMP

- Existing Projects

Maintenance and Update of ETSS's (ECT and UT) - Includes loose part wear ET technique development and demonstration of UT lamb wave technique for OD tube side evaluation. Also addresses continuity of core competencies and lab equipment.	Steve Swilley
QDA/SSPD Maintenance and Updates - Also addresses continuity of core competencies and software tools	Steve Swilley
PWR SG Examination Guidelines - Also addresses core competencies	Steve Swilley
Direct Utility Support	Steve Swilley
Data Union Sample Development Phase 1 - Small effort to develop sufficient experience to develop core competencies	Steve Swilley
QA of ETSS Program - Support of internal and external audits, procedure and program updates, and program maintenance/oversite including commercial grade dedication, calibration activities, and procurement.	Steve Swilley
Data Union Sample Development Phase 1 - Large effort to develop library of flaw signals for future development work	Steve Swilley
Develop PC Based SSPD Application	Steve Swilley
AAPDD - Proctor of Examinations	Steve Swilley
Tools Project Support for PWSCC Performance Demonstration Phase 2 - Resolution of peer review comments, conduct of the performance demonstration, and compiling results	Steve Swilley
Fabrication and Destructive Analysis of Samples - Development of Crack Specimens with minimum effort to maintain competency of vendor	Steve Swilley

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Steam Generator Management Program (SGMP)

- Existing Projects Cont.

Fabrication and Destructive Analysis of Samples - Development of Crack Specimens with sufficient effort to continue with completion of flaw matrix.	Steve Swilley
Development of Standardized Process for Determining Examination Technique Equivalency	Tom Bipes
Development of an Eddy Current Data Analysis Guideline and Datasets for Detection of Loose Parts and Loose Parts Wear	Tom Bipes
Enhance Eddy Current Data Analysis Performance Demonstration Database (AAPDD) Using Data Union Software	Tom Bipes
Development of Sizing Technique for Improved Measurement Accuracy of Crack Depth Profiles, using EPRI AutoAnalysis Software	Tom Bipes
Development of Array Probe Automatic Data Analysis Software	Tom Bipes
Development of Software Tool for Simulating Eddy Current Responses to Various SG Conditions	Tom Bipes
Perform Feasibility Study for Development of a Technique to Accurately Size Loose Part Tube Wear from SG Secondary Side	Tom Bipes
Development of Computer Based Training for SSPD	Tom Bipes
Model Based POD Techniques for Enhancing Reliability of EC SG Inspection	Tom Bipes

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Steam Generator Management Program (SGMP)

- Proposed Projects

Annual SG NDE Workshop	Steve Swilley
QA of ETSS Program - Support of internal and external audits, procedure and program updates, and program maintenance/oversite including commercial grade dedication, calibration activities, and procurement.	Steve Swilley
Maintenance and Update of ETSS's (ECT and UT) - Includes continuing loose part wear ET technique development. Also addresses continuity of core competencies and lab equipment.	Steve Swilley
QDA/SSPD Maintenance and Updates - Also addresses continuity of core competencies and software tools	Steve Swilley
PWR SG Examination Guidelines - Also addresses core competencies	Steve Swilley
Data Union Sample Development Phase 1 - Small effort to develop sufficient experience to develop core competencies	Steve Swilley
Data Union Sample Development Phase 1 - Large effort to develop library of flaw signals for future development work	Steve Swilley
Direct Utility Support	Steve Swilley
Fabrication and Destructive Analysis of Samples - Development of Crack Specimens with minimum effort to maintain competency of vendor	Steve Swilley
Fabrication and Destructive Analysis of Samples - Development of Crack Specimens with sufficient effort to continue with completion of flaw matrix.	Steve Swilley
Tools Project Support for PWSCC Performance Demonstration Phase 3 - Conduct of second peer review, resolution of peer review comments, and publishing ETSS's	Steve Swilley
AAPDD - Proctor of Examinations	Steve Swilley
Fabrication and Destructive Analysis of Samples - Metalurgical Evaluation of Crack Specimens	Steve Swilley
Develop eddy current training for SG program engineers	Steve Swilley

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Steam Generator Management Program (SGMP)

- Proposed Projects Cont.

Tools Project Support - Update ETSS's with MAPOD performance predictions	Steve Swilley
Development of Standardized Process for Determining Examination Technique Equivalency	Tom Bipes
Development of an Eddy Current Data Analysis Guideline and Datasets for Detection of Loose Parts and Loose Parts Wear	Tom Bipes
Enhance Eddy Current Data Analysis Performance Demonstration Database (AAPDD) Using Data Union Software	Tom Bipes
Development of Computer Based Training for SSPD	Tom Bipes
Development of a Technique to Accurately Size Loose Part Tube Wear from SG Secondary Side	Tom Bipes
Engineering Design Guideline for POD Modeling	Tom Bipes
Model Based POD Techniques for Enhancing Reliability of EC SG Inspection	Tom Bipes
Evaluation of NRC/ANL Data Analysis Algorithms	Tom Bipes
Develop new Table for SGDD for Foreign Object Library	Tom Bipes
Assessment of Future Long Term Data Storage Capabilities	Tom Bipes
Assessment of the Separate Effect of Error Sources on The Final Estimation of Flaw Size - A Case Study	Tom Bipes
Rotating Magnetic Field (RMF) Probe Development for SG Tube Inspection	Tom Bipes
Novel Algorithms for Flaw Profiling in SG Eddy Current Inspection	Tom Bipes

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Totals

- NDEC
  - 47 active projects
  - 22 proposed
- MRP
  - 21 ongoing and proposed projects
- BWRVIP
  - 3 long term multi tasks projects
- Technical Innovation (TI)
  - 6 active projects
  - 1 proposed
- ANT (New Plant)
  - 1 active project
  - 1 proposed
- SGMP
  - 21 active projects
  - 28 proposed

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Summary

- Multiple NDE related projects are underway and many more have been proposed for 2010
  - 99 active projects
  - 52 proposed
- Industry is very active in NDE development and is looking forward the needs of both the existing fleet and the potential construction of new plants

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