Enclosure 15

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PDI/NRC Meeting

ELECTRIC POWER RESEARCH INSTITUTE

NDE Guideline for Examination of Dissimilar Metal Welds

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NDE Guideline for Examination of Dissimilar Metal Welds

- EPRI is developing a guideline for utilities and their vendors use in preparing for, and executing, DM weld examinations
  - At the request of the NDE APWG
  - Intended to help address recent industry OE
- **<u>The guideline is still in DRAFT</u>**
  - Very little utility review so far
  - Will be reviewed by NDE APWG, NDE Steering Committee, and PDI Steering Committee
  - Review will be requested from BWRVIP, MRP, probably MTAG

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NDE Guideline for Examination of Dissimilar Metal Welds

DOCUMENT CONTENTS

- Executive Summary
- Introduction
- Section on Human Factors
- Section on the role of the Utility
- Section on the role of the Vendor
- Section on collaboration between Utility and Vendor
- Conclusions

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Executive Summary Section

- The guideline is a compilation of existing lessons learned pertaining to dissimilar metal weld examinations.
- The keys to successful DM weld examinations are:
  - Planning
  - Performing walkdowns to verify configuration and surface condition
  - Early engagement and teaming with examination vendor
  - Review of procedures and implementation plan

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Section 2 –Human Factors

- Environmental factors
  - Physical stress: heat, radiation dose, contamination, limited access
  - Time stress: complex examination with schedule and dose constraints
- Decision making
  - Assessment of surface condition - accountability
  - Evaluation of data quality for encoded examinations
  - Evaluation of indications – understand the process
- Proper planning and exam preparation will reduce errors due to human factors

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Section 3 – Role of the Utility

- Bid specification
  - Prepare early, provide technical details
- Qualification Reviews
  - Make sure procedures and personnel qualification align with site configurations
  - Prepare ahead of time for scope expansions
- Training
  - Ensure vendor personnel complete training suitable to the examination scope and NDE procedures
  - For encoded examination, one or more utility personnel should able to operate the data analysis software for independent review

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Section 3 – Role of Utility

- Surface condition – key factor for data quality
  - Implement a “Surface Condition Assessment and Improvement Program” for dissimilar metal welds
  - Perform “walkdowns” to:
    - Determine the as-built configuration of each weld
    - Calculate the achievable examination coverage
    - Plan for any physical modifications necessary to improve coverage (Interference removal, mitigation)
  - Be prepared to perform additional surface preparation during the outage – if needed

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Section 3 - Role of Utility

- Pre-job briefing
  - Lead a detailed pre-job brief with appropriate utility and vendor staff
    - Emphasis on: surface condition, weld history, role of examiner, role of utility personnel, and relevant operating experience (OE)
- Examination performance
  - During examinations, monitor each milestone of the exam to ensure that the work is progressing as expected
  - Provide support as agreed during pre-job brief

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Section 3 – Role of Utility

- Documentation of results
  - Review vendor examination reports promptly and thoroughly
    - Prompt reviews allow for timely initiation of any necessary supplemental NDE, repairs, or scope expansion
    - Ensures that each examination was performed in a qualified manner

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Section 4 – Role of Vendor

- There are four key areas where a vendor can assist in improving human performance during NDE:
  - Develop well-structured procedures
    - PDI generic procedures can be used as a template
  - Provide adequate training to examiners
    - Annual Appendix VII training should cover industry OE
  - Good preparation and oversight
    - Readiness Review Assessment
  - Incorporate industry lessons-learned into the data review process
    - Data review criteria should be established for both manual and encoded examinations
    - this guideline provides example criteria that can built into examination procedures

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Section 5 – Collaboration - Utility and Vendor

- A close partnership between the utility and vendor should be established well before the outage
- Each DM weld should have a well-developed examination plan and clear expectations for its execution
- Ensure that all qualified equipment, procedures, and personnel for workscope will be available onsite
- Good communication between the utility and the vendor throughout the process

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Section 6 - Conclusions

- Section 6 contains a table summarizing key recommendations for planning, preparing for, and executing a successful DM weld examination
- The document is a culmination of all the DM weld examination OE that has been collected over the years
- The goal is to communicate “best practices” to the industry, so that utilities and vendors will be well prepared for future DM weld examination campaigns

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