U.S. NRC and Industry Public Meeting

Buried/Underground Piping

American Society of Mechanical Engineers

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ASME SCXI Buried Component Activities

Committee Groups Relevant to Buried Components

- TG Buried Component Inspection & Testing
- TG Evaluation Procedures for Degraded Buried Piping
- WG Pressure Testing
- Special WG Nuclear Plant Aging Management
- SG Water Cooled Systems
- SG Nondestructive Examination
- SG Industry Experience for New Plants

ASME SCXI Buried Component Activities

Current Section XI Rules

- IWA-5244, Buried Component Leakage Tests
  - Visual of Annulus
  - Pressure Decay or Change in Flow
  - Unimpaired Flow
- Code Case N-776, Ground Surface Examination Program (Approved April 2010)
- Code Case N-806 (Approved June 2012)
  - Evaluation of Metal Loss for Cl. 2&3 Buried Metallic Pipe with Back-Fill

ASME SCXI Buried Component Activities

TG BCIT – Recent Timeline

- November 2010
  - → TG Approved by Executive Committee
  - → Charter Established
- 2011 (January 31, May 9, August 8, November 7)
  - → Membership, Interest Groups, Scope, Data Collection
  - → Initial Action Items & First Code Paragraph Considerations
- 2012 (February 6, May 14, August 13, November 5)
  - → Identification of Code Areas for Inclusion/Update
  - → Code Case Alternatives to IWA-5244
  - → Code Action for BP Risk Ranking and Inspections
- 2013 (February 11, May 13, August 12)
  - → Action Items (Definitions, Methods, Fukushima, Inspection)
  - → Letter Ballots (Leakage Testing & Risk Ranking & Acceptance)
  - → Next Meeting in Atlanta on October 28, 2013

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TG BCIT – Goals

- Consider All Stakeholders
- Evaluate the Safety and Functional Impact of Recent Operating Experience
- Compile Industry Group Activities and Guides
- Assess and Support Inspection Technique Development
- Codify Best Practices
- Publish a Practical, Manageable set of Technically Sound Rules for Regulatory Endorsement

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TG BCIT – Scope

- Buried and Underground Piping & Components
- Commission Activities
- Industry Groups (NEI, EPRI, INPO, NACE, BPIG)
- TG Charter
  - Programmatic
  - Inspection & Testing
  - Mitigation, Repair, Replacement
  - Design and New Plants

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TG BCIT – Scope, Phased Approach

- Component Classifications

Safety Related

- Classed 1, 2, and 3
- Non-Classed

Non-Safety Related

- Many Considerations
  - Function
  - Impact
  - Jurisdiction
  - Owner

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TG BCIT – Action Item Status

AI #1	Liaisons – NACE and Section V	Initial Complete
AI #2	Develop Historical White Paper	Closed
AI #3	Define Scope	Initial Complete
AI #4	Compile Industry Papers	Initial Complete
AI #5	**List of BP Inspection Methods**	**Open**
AI #6	EPIX Operating Experience	Initial Complete
AI #7	BPI Initiative Timeline	Closed
AI #8	**Codify New IWA-5244 Rules**	**Open**
AI #9	**Risk Ranking Methodology**	**Open**
AI #10	**Non Mandatory App - IWA-5244 Guide**	**Open**
AI #11	Fukushima Lessons Learned	Closed
AI #12	**IWA-9000 Buried Comp Definition(s)**	**Open**
AI #13	**Examination Category Tables**	**Open**

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TG BCIT – AI #5, List of BP Inspection Methods

- First Compilation, No Screening Criteria

Direct

- Visual Inspection
- Liquid Penetrant Testing
- Magnetic Particle Testing
- Guided Wave
- Lamb Wave
- Remote Field Testing
- Magnetic Flux Leakage
- UT & Inspection Vehicles
- Radiography
- Electromagnetic Technology

Indirect

- Pipe-to-Soil Potential
- Direct Current Voltage Gradient
- Pearson Survey / Alternate Current Voltage Gradient
- Close Internal Potential Survey
- Area Potential Earth Current
- Soil Analysis

- Next : Industry Survey Results – Bin what Plants are currently doing, Lessons Learned

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TG BCIT – AI #8, Codify New IWA-5244 Rules

AI #10, Non Mandatory App – IWA-5244 Guide

- Assess Current IWA-5244, Leakage Testing Rules for Buried Components
- Letter Ballot 12-2562, (2) New Code Cases
  - For Comment Ballot (Vote: 1-6-0-11)
  - Theme: Basis for 09-14 in Leakage Testing? Needed?
- Letter Ballot 12-2562, New NM Appendix (Guide)
  - For Comment Ballot (Vote: 1-6-0-11)
  - Theme: Basis for Acceptance Criteria and Hold Time?
- August TG Feedback: IWA-5244 okay as is for leakage testing.

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TG BCIT – AI #9, Risk Ranking Methodology

- Consideration of Current Industry Methods
- Build off of other SCXI Risk Informed Activities
- Initial Draft in November Identified Challenges
  - Scope (Traditional SCXI Exemptions, e.g. small bore)
  - Consequence vs. Failure Potential Matrix
  - Safety Related High, Binning Remaining (Nuclear Safety vs. Industrial, Environmental, and Plant Ops)
- Letter Ballot 13-392, Risk Ranking Process
  - For Comment Ballot (Vote: 9 Comment Ballots)
  - Theme: Ranking Matrix / Bins,
    Risk-Informed v Practicality Based

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TG BCIT – AI #12, IWA-9000 Buried Component Definition(s)

- Handout Discussed at February Mtg
- One Definition for Buried Components
- One Definition for Underground Components
- Resultant Options:
  1. Similar to NRC definition from Gall
  2. Similar to NEI definition from 09-14
  3. Hybrid
- Two Draft Definitions Presented in May Mtg
  - Straw vote direction: combine Buried / Underground

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TG BCIT – AI #13, Examination Category Tables

- Consider New Tables
  - IWC-2500-1 Category C-_ & IWD-2500-1 Category D-_
- Inspect for Degradation, Not Leakage
- Reference New Mandatory Appendix for Rules
- Sponsors Assigned to Appendix Sections
  - Z-1100, Scope
  - Z-1200, Components Subject To Examination, Risk Ranking
  - Z-2000, Examination Methods
  - Z-3000, Acceptance Standards (Letter Ballot following May Mtg)
  - Z-4000, Repair / Replacement Activities (May Mtg: see IWA-4000)
  - Z-6000, Records and Reports

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Summary

- Strengthening ASME Standards relative to Buried Component Inspection
- Consideration of Ongoing Industry Activities
- Phased Approach to System Scope
- Enabling Clear Requirements and Consistent Fleet Implementation