

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, Initial Action Items, Data Collection
  - 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 Additions for BP Risk Ranking and Inspections
- February 11, 2013
  - Next Meeting in Los Angeles

# ASME SCXI Buried Component Activities

## ***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

# ASME SCXI Buried Component Activities

## ***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

# ASME SCXI Buried Component Activities

## *TG BCIT – Scope, Phased Approach*

- Component Classifications

### *Safety Related*

- <sup>1</sup> • Classed 1, 2, and 3
- Non-Classed

### *Non-Safety Related*

- Many Considerations
  - Function
  - Impact
  - Jurisdiction
  - Owner

# ASME SCXI Buried Component Activities

## ***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
<b>AI #5</b>	<b>List of BP Inspection Methods</b>	<b>Open</b>
AI #6	EPIX Operating Experience	Initial Complete
AI #7	BPI Initiative Timeline	Closed
<b>AI #8</b>	<b>Codify New IWA-5244 Rules</b>	<b>Open</b>
<b>AI #9</b>	<b>Risk Ranking Methodology</b>	<b>Open</b>
AI #10	Non Mandatory Appendix IWA-5244 Guide	Open
AI #11	Fukushima Lessons Learned	Open
AI #12	IWA-9000 Buried Component Definition(s)	Open
<b>AI #13</b>	<b>Examination Category Tables</b>	<b>Open</b>

# ASME SCXI Buried Component Activities

## ***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

# ASME SCXI Buried Component Activities

## ***TG BCIT – AI #8, Codify New Rules***

- Update Current IWA-5244, Buried Components
- New Code Cases (2 out for Ballot)
- New Non Mandatory Appendix (Guidance)
- Consider IWA-2200 Examination Methods

# ASME SCXI Buried Component Activities

## ***TG BCIT – AI #9, Risk Ranking Methodology***

- Consideration of Current Industry Methods
  - Approx. 3 in Practice
- 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)
  - Will Phased Approach Support Ranking

# ASME SCXI Buried Component Activities

## ***TG BCIT – AI #13, Examination Category Tables***

- Consider New Tables
  - IWC-2500-1 Category C-\_\_ & IWD-2500-1 Category D-\_\_
- New Shell Tables
  - Parts Examined
  - Exam Requirements
  - Exam Method
  - Acceptance Criteria
  - Extent of Exam
  - Frequency of Exam
- Inspect for Degradation, Not Leakage
- Appendix for Rules such as Risk Ranking

# ASME SCXI Buried Component Activities

## *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