

EPRI

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Workshop on Life Beyond 60

Buried Piping: Issues and the Approach to Resolution

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Underground Piping and Tanks Integrity

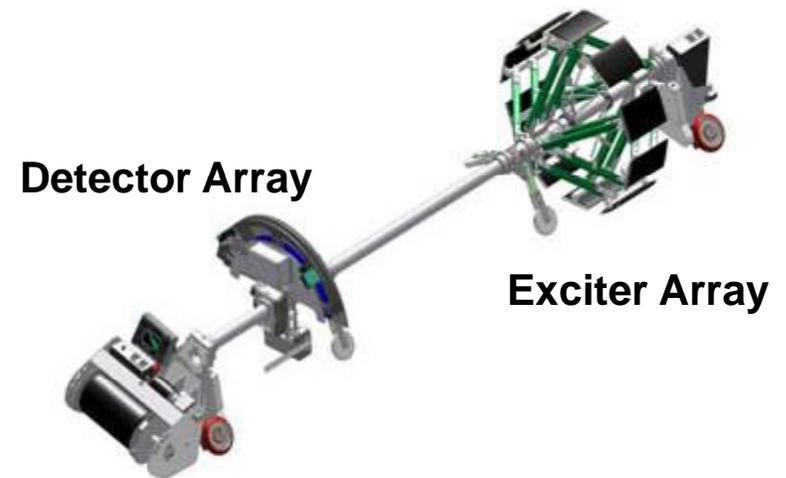
- **Issue**

- Leaks resulting in costly inspections & repairs of Buried Piping

- Buried assets reaching 40 years of age
- Variability in extent

- **Solution involves:**

- Providing the industry with knowledge, skills and technology to manage the effects of buried asset aging



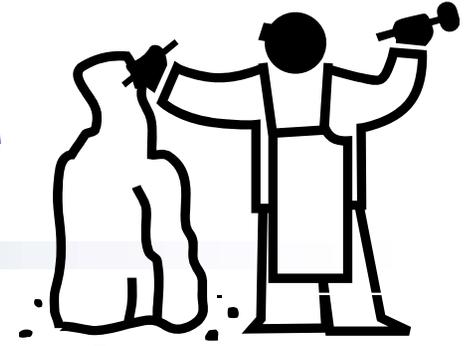
Current Industry Activities

- Adopt an NSIAC Underground Piping and Tanks Integrity Initiative to address all buried piping
 - Procedures and oversight
 - Prioritization through risk ranking
 - Inspections
 - Asset management plan
- Develop an NEI Guideline (NEI 09-14) to supplement existing guidance
 - Guide Initiative implementation
- Underground Piping and Tanks Integrity Initiative supplements the Ground Water Protection Initiative

Underground Piping and Tanks Integrity Initiative

- **Goal: reasonable assurance of leakage and structural integrity of buried piping with emphasis on piping containing radiological material**
 - Six implementation milestones
 - 1. Procedures and oversight by 6/30/10
 - 2. Risk ranking of piping by 12/31/10
 - 3. Inspection plan by 6/30/11
 - 4. Start inspections by 6/30/12
 - 5. Condition assessment of piping containing radioactive material by 6/30/13
 - 6. Asset management plan by 12/31/13
- **Reality: Work is underway now**

Other “Drivers” shaping the response



- The ‘Regulatory Arena’
 - Public and congressional confidence in the NRC
 - NRC playing a role
 - Groundwater Task Force Final Report
 - International Regulators watching
- Limitations of existing NDE inspection technology & piping systems
- Evaluation of inspection findings
 - No Codes & Standards for Buried Pipe
- Cost of inspection & repair/replacement
- Industry commitments:

Underground Piping and Tanks Integrity Initiative

Buried Piping Integrity – LB60 Perspective

- Current issues are driving substantial industry response
 - Degradation variables support a life cycle management approach
 - Prioritize, inspect, evaluate, develop life cycle management (LCM) actions on specific pipe run basis
 - LB60 considerations can be integrated into the LCM process
 - Refinements in LCM tools are in process and expected to improve performance
 - Front end prioritization and inspection
 - Back end remediation/repair

Buried Piping Integrity – LB60 Perspective

- Opportunities that Address Root Cause Issues
 - Cathodic Protection Revisited
 - Replacement with High Density Polyethylene (HDPE)
 - Code and acceptance issues to be resolved
 - 10 year inspection requirement to be resolved
- Expectation that current levels of effort will support a robust LCM process for buried piping that will allow safe and reliable operation for > 60 years
 - Plant/system specific actions

Current EPRI Work

- From Balance of Plant Corrosion Program
 - Buried Pipe Program Development Support
 - Version 2.0 of Risk Ranking software
 - Update to the “Recommendations” document
 - Reference Materials
 - Buried Pipe Reference Guide Update
 - Codes & Standards support
 - Continue High Density Polyethylene Pipe Code Case Support
 - Continue to Support Design Rules for Buried Pipe Code Case
 - Continue to Support Fitness for Service for Buried Pipe Code Case

Current EPRI Work

- **NDE**

- Development of ID inspection technology
- Substantive work on guided wave ultrasound (GWUT)
 - Technology evaluation
 - Training
- Buried pipe test facility constructed
- Buried Pipe Reference Guide
 - Identification and evaluation of today's inspection technologies



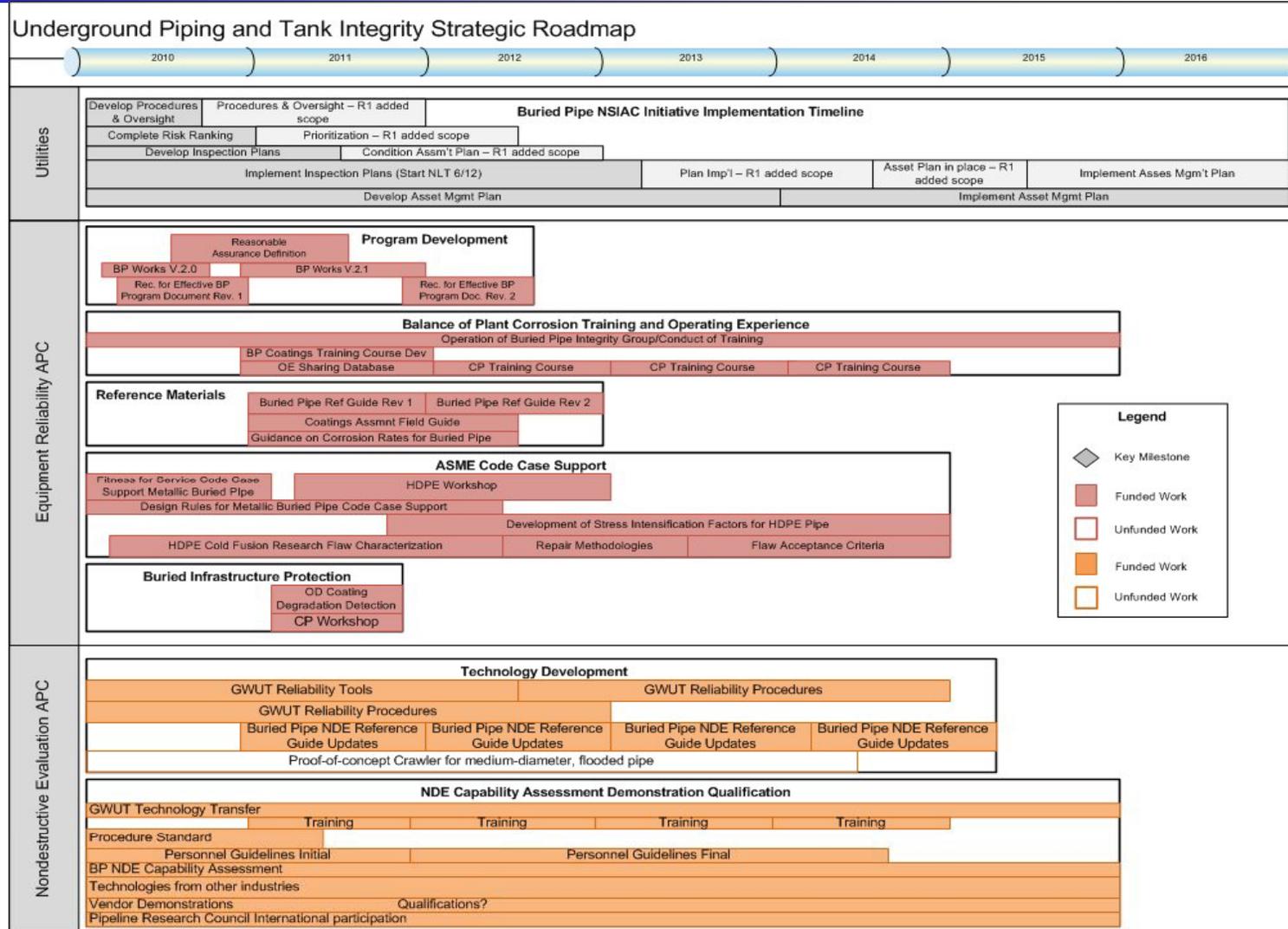
Buried Piping Issues Related to EPRI Long Term Operation (LTO) Program

- **Two LTO Issues appear on the Issue Tracking Table with "MEDIUM" priority"**
 1. Monitoring, assessment of degradation, and estimation of remaining useful life (RUL)
 2. New materials and methods for BOP system replacement/refurbishment
- **Item 1 above is address by the LTO Integrated Life Cycle Management (ILCM) Project**
 1. Monitoring and plant specific data collection is to be consistent with requirements of Industry Initiatives
 2. Generic information, failure rate model, and RUL method are addressed by the ILCM database and assessment method
- **Work on item 2 above will be considered after the effectiveness of the industry aging management programs can be determined.**

LCM Tools Development and Refinement Opportunities

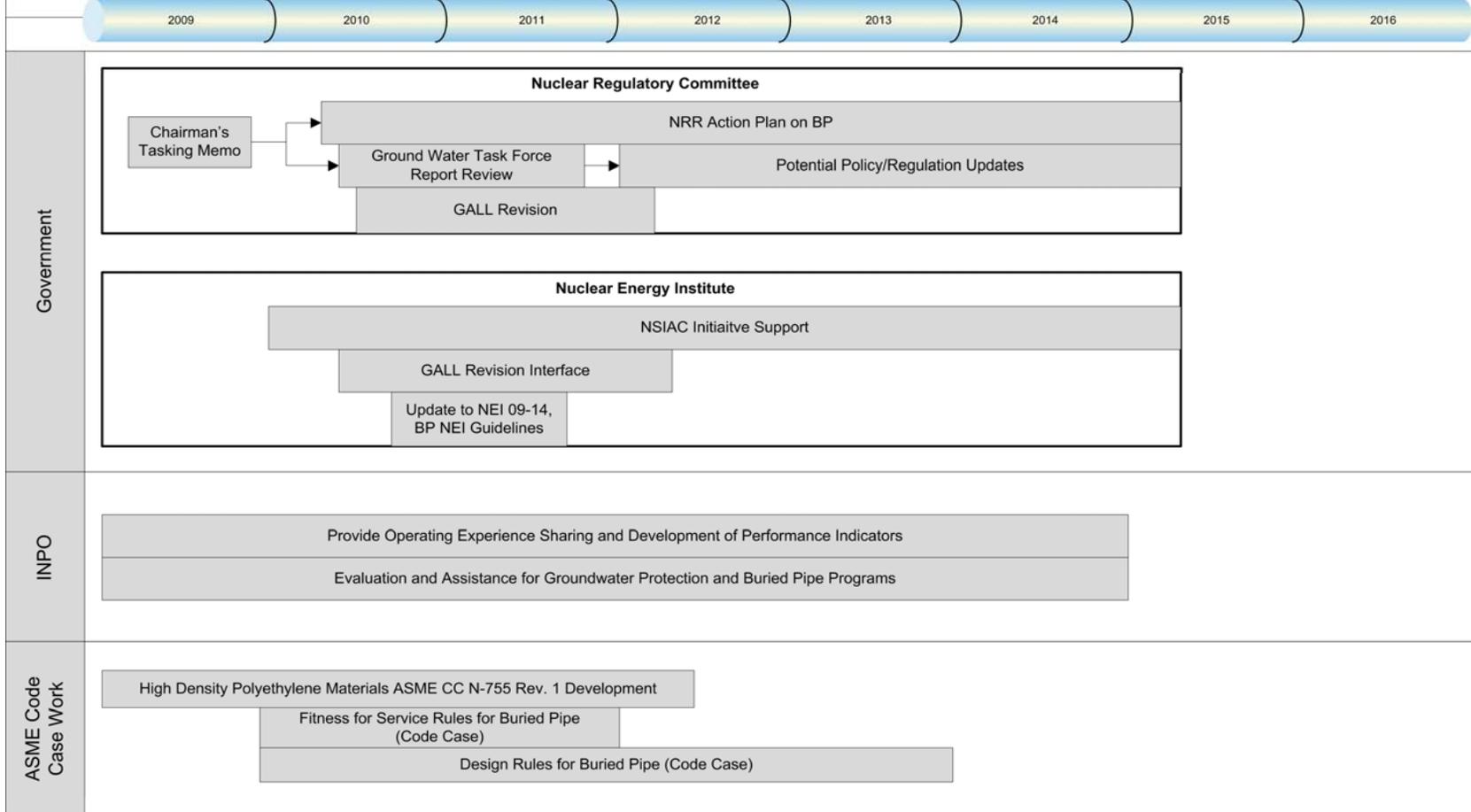
- Software Tools and Data to Refine Models
 - BPWorks™, V2.1
- Coatings Assessment Field Guide
- Update to the “Recommendations” document
- Update to the Buried Pipe Reference Guide
- Cathodic Protection User Group being formed
- Research on indirect OD pipe coatings assessment
- Continued work on NDE methods
 - Faster, better, cheaper
 - Field application performance

EPRI Underground Piping and Tank Integrity Strategic Roadmap



EPRI Underground Piping and Tank Integrity Strategic Roadmap

Underground Piping and Tank Integrity Strategic Roadmap



Summary

- Current Industry Efforts are Driving Actions on Buried Piping Integrity
- Aging Dependent Damage to be Addressed by Life Cycle Management Approach
 - R&D opportunities to create faster/better/cheaper tools
 - NDE
 - Cathodic Protection
 - Remediation/replacement
 - EPRI strategic plan in place to drive effective application of tools



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