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UNITED STATES NUCLEAR REGULATORY COMMISSION  
*Protecting People and the Environment*

# Buried Piping

- Agenda
  - Introductory remarks - NRC
  - Overview – NRC
  - Industry presentations
    - NEI
    - EPRI
    - INPO
  - Other remarks
    - NACE
  - Questions

# Buried Piping Degradation



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## Buried Piping

### Definition of Success for Management of Buried Piping

- Degradation of buried piping is managed in a manner that provides reasonable assurance there are no challenges to safe plant operation and no unintended releases that adversely impact the environment.



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## Buried Piping

### Background

- There have been multiple instances of degraded buried piping leaks causing inadvertent releases of radioactive material and petroleum product to the environment at nuclear power plants
  - Some of these leaks have resulted in tritium ground contamination at several plants.
  - Some of these leaks occurred in safety-related piping



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## Chairman's Tasking Memo

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- The Commission has directed the agency to take a focused look at the adequacy of current regulations, codes, standards and industry initiatives related to management of degradation of buried pipe (ML092460648). This evaluation may indentify needed enhancements.



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## Staff Actions

- NRC staff is developing an action plan to evaluate, as they relate to plant safety and the health of the environment:
  - Current regulations
  - Codes and standards requirements
  - Industry initiatives
- Provide action plan to Commission by 12/3/2009.
- Plan will include timeframe for complete evaluation.
- Once these evaluations are complete the staff will recommend any needed enhancements to regulations, codes, standards and practices.



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## Technical Approach

- Identification and Scoping
  - Importance
  - Contents
  - Configuration
- Maintenance
  - Cathodic protection and coatings
  - Inspection



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## Regulations and Guidance

- 10 CFR 50.55a, “Codes and Standards,”
- 10 CFR 50.65, “Requirements for monitoring the effectiveness of maintenance at nuclear power plants,”
- 10 CFR part 54.21(a), “Aging Management”
- 10 CFR Part 50 Appendix A, “General Design Criteria (GDC)”
  - GDC 44, “Cooling Water,” requires provision of a system to transfer heat from SSCs important to safety to an ultimate heat sink
  - GDC 45, “Inspection of Cooling Water System,” requires design that can be inspected such as heat exchangers and piping to assure integrity and capability of the system
  - GDC 46, “Testing of Cooling Water System,” requires design to permit appropriate periodic pressure and functional testing
- 10 CFR 20.1406, “Minimization of Contamination”
- Regulatory Guide (RG) 4.21, “Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning,”
- GL 89-13, “Service Water Problems Affecting Safety-Related Equipment,” requests information on how the GDCs are satisfied and provides a method the staff finds acceptable for meeting the GDCs





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## Codes and Standards

- ASME Code
- NACE Standards
  - RP0502-2002 (Standard Recommended Practice, Pipeline External Corrosion Direct Assessment Methodology)
  - SP0169-2007 (Standard Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems)
  - RP0285-2002 (Standard Recommended Practice, Corrosion Control of Underground Storage Tank Systems by Cathodic Protection)
  - RP0193-2001 (Standard Recommended Practice, External Cathodic Protection of On-Grade Metallic Storage Tank Bottoms)
- The AWWA (American Water Works Association Denver CO) also has standards concerning pipe coatings and linings



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## Practices

- The industry has programs that address management of buried piping.
  - Described in August public meeting
  - Purpose today
    - Hear a description of industry's plans, programs and schedule for addressing degradation of buried piping to enable the staff to make an informed evaluation of the state of current regulations and practices



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## Buried Piping

- Identify gaps, if any, in existing regulations, codes, standards and practices
- Close the gaps