



U.S. NRC

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



U.S. NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Bob Hardies, NRR

October 22, 2009



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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.



U.S. NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Chairman's Tasking Memo

- 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.



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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.



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Technical Approach

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



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Buried Piping

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