

Overview of the Industry Ground Water Protection and Underground Tanks and Piping Integrity Initiatives

NRC Requirements Assure Public Health and Safety

- **10 CFR 20 Subpart D Public dose limits**
- **10 CFR 20 Subpart F Surveys & monitoring**
- **10 CFR 50.34a Design objectives**
- **10 CFR 50.36a Technical Specifications**
- **10 CFR 50.75 Recordkeeping for decommissioning planning**
- **10 CFR 50 Appendix A General Design Criteria**
- **10 CFR 50 Appendix I Numeric Guidance to meet ALARA**

- **40 CFR 190 Environmental radiation protection standards for nuclear power plants**

Chronology

- **Late 1990s – mid 2000s licensed material identified in subsurface soils and ground water at decommissioning facilities**
- **November 2005 Nuclear Energy Institute (NEI) formed industry task force**
- **Chief nuclear officers approved Ground Water Protection initiative (GPI): May 2006**
 - **Effective August 1, 2006**
 - **Final Industry Guidance NEI 07-07: August 2007**
- **NRC Liquid Radioactive Releases Lessons Learned Taskforce: March 2006.**
 - **Report issued September 2006 ML062650312**

Chronology

- **NRC tasking memo on Buried Piping: September 2009**
- **NSIAC approved Buried Piping Integrity Initiative: November 2009 NEI 09-14**
 - **Underground Piping and Tanks Integrity Initiative: September 2010**
- **NEI-sponsored peer assessments performed 2009-2011**
- **Vermont Yankee leak identified: January 2010**
- **NRC Groundwater Contamination task force: March 2010**
 - **Senior Management Review Group formed: June 2010**
- **NRC TI 2515/173 inspections: September 2008-August 2010**

Chronology

- **NRC Commission briefing SECY-11-0019: February 2011**
 - **Industry Initiatives should not become regulations**
 - **Evaluate creating a leading performance indicator**
 - **Evaluate rulemaking on remediation during operation**
 - **Participate in developing consensus standards on piping integrity**
- **GAO audit of NRC actions, policies, and procedures on buried piping: report : June 2011**
 - **should periodically evaluate industry's implementation of initiatives**
 - **should keep up to date on industry research to develop technologies for structural integrity tests**
- **NRC Commission vote on SECY-11-019 August 2011**

Ground Water Protection Initiative

Objectives:

- 1. Improve management of situations involving inadvertent releases into ground water**
- 2. Improve communication with external stakeholders to enhance trust and confidence**

Applicable to all U.S. nuclear power plants

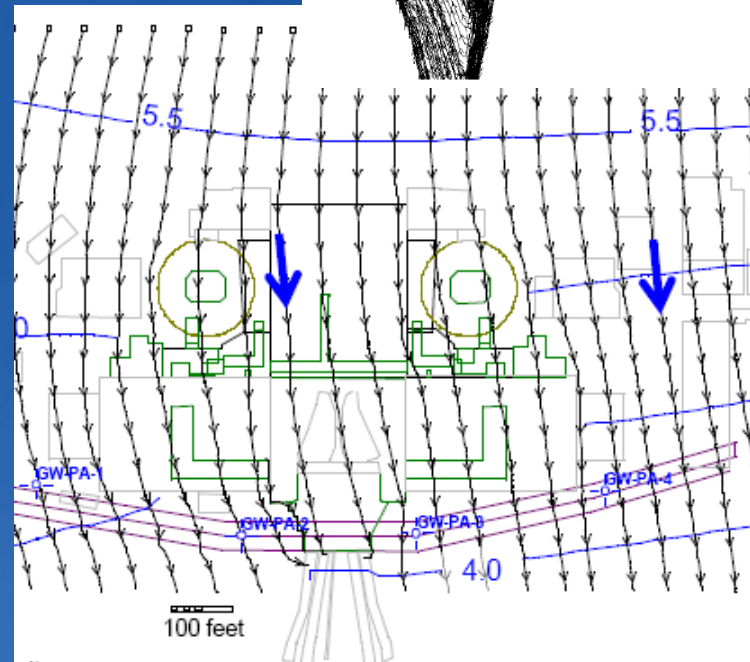
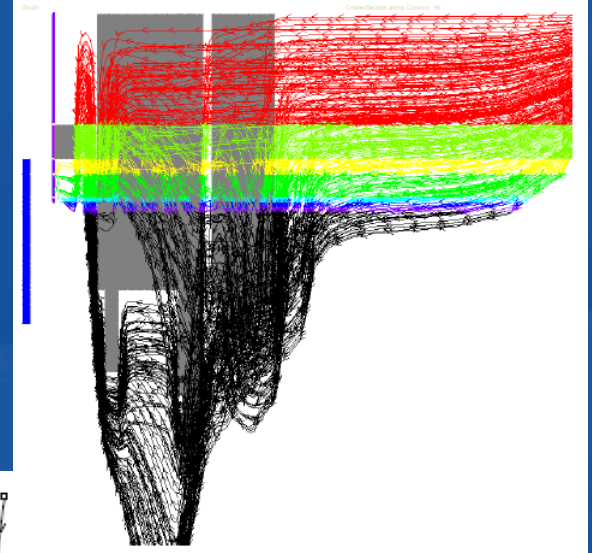
- Currently operating**
- Decommissioning**
- New plants**

Ground Water Protection Initiative

- **Action 1: Improve management of situations involving inadvertent radiological releases that get into ground water**
 - Update site hydrology and geology
 - Evaluate systems, structures, and components and work practices
 - Implement early detection and monitoring
 - Establish remediation decision making protocol
 - Augment record keeping for decommissioning planning

Site Hydrology and Geology

- Review historical data
- Perform site studies
- Identify potential migration pathways
- Review periodically
- Update licensing document



Site Risk Assessment

- **Identify each SSC and work practice that involves licensed material that could credibly leak to the environment**
- **Identify existing leak detection methods**
- **Identify potential enhancements**
 - **Leak detection systems**
 - **Spill/leak containment systems**
- **Identify mechanism to track actions**
- **Establish long term surveillance or preventative maintenance programs**
- **Establish frequency for periodic reviews**

Example of Risk Assessment

EXAMPLE RISK ASSESSMENT, EPRI 1015118				LIKELIHOOD			CONSEQUENCE			
SSC/Work Practice	Design features	Operating conditions	Maintenance/spills	History	Condition	Design	Inventory	Hazard	Mobility	Post-Release Detection
Spent Fuel Pool										
Refueling Water Storage Tank										
Condensate Storage Tank										
Sampling or draining radioactive liquids										
Filling or draining tanks and sumps										
Storage of radioactive material exposed to weather										
Transfer of spent ion exchange resin										
Draining of auxiliary steam blowdown										
Use of hydrolaser for cleaning radiologically contaminated systems										
Use of secondary cooling water re-circulated within a closed-loop system that may become contaminated by primary systems										
Use of auxiliary steam for building heat supply or to provide freeze protection for tanks containing radioactive liquid										

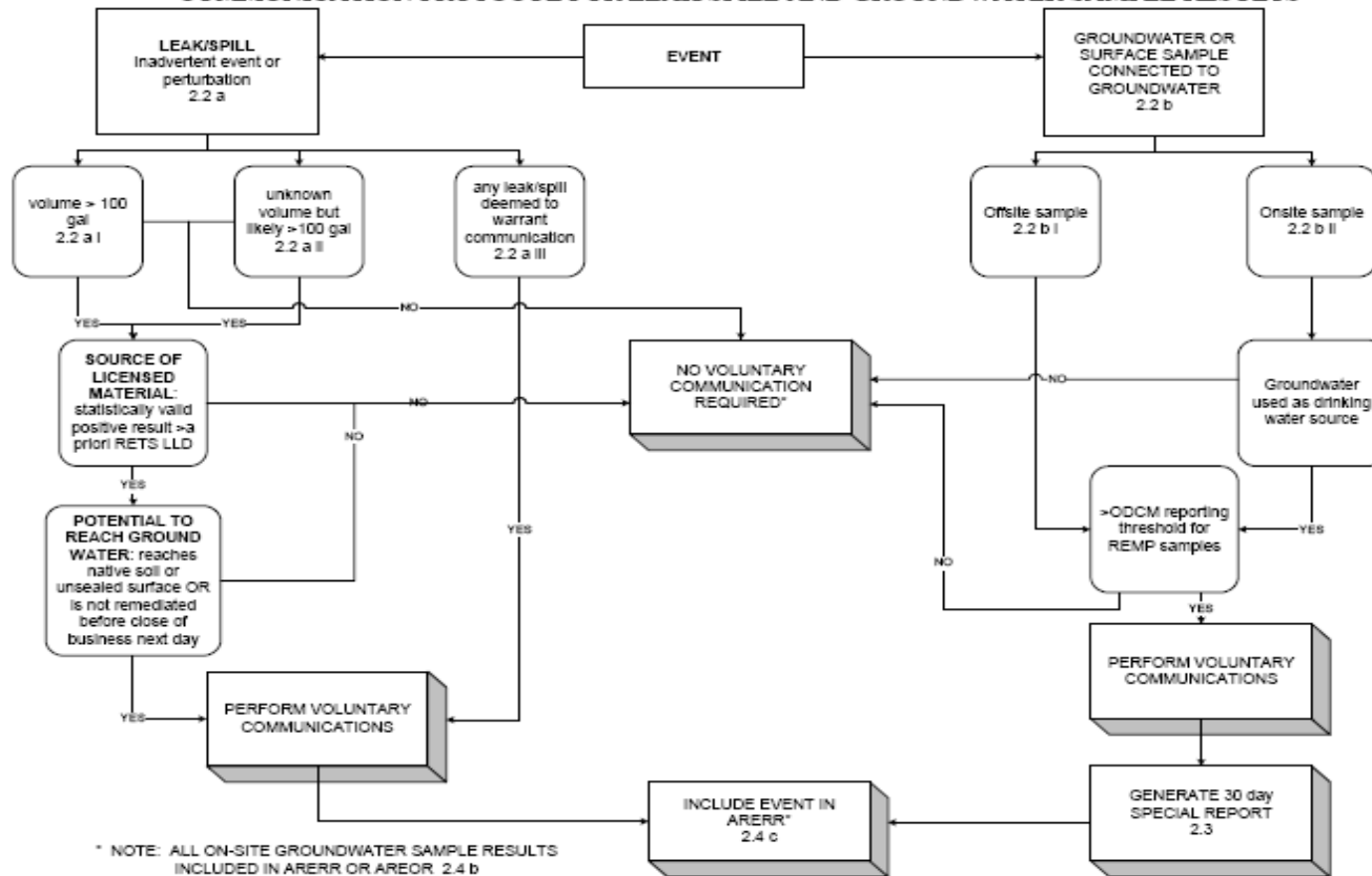
Ground Water Protection Initiative

- **Action 2: Improve communication with external stakeholders to enhance trust and confidence**
 - Periodic briefings of external stakeholders
 - Voluntary communication
 - Leaks/spills to the environment
 - On-site ground water samples > environmental reporting thresholds
 - 30 day report
 - Annual report
 - Voluntary communication events
 - On-site ground water sample results

Voluntary Communication

NEI 07-07 (Final)
August 2007

APPENDIX A COMMUNICATION PROTOCOL FOR LEAK/SPILL AND GROUNDWATER SAMPLE RESULTS



Ground Water Protection Initiative

- **Action 3: Perform program oversight to ensure effective implementation of the GPI program**
 - Independent self assessment
 - NEI-sponsored peer assessment
- **Expectation that sites will address observations and deficiencies through corrective action program**
- **Assessments performed at least every 5 years**
 - Next round of NEI-sponsored peer assessments being planned and will begin shortly

Buried Piping Integrity Initiative

- **Buried Piping Integrity Initiative approved by NSIAC - November 2009**
 - Proactive assessment and management of buried piping systems
 - Share industry experience
 - Drive development of technology for inspection techniques

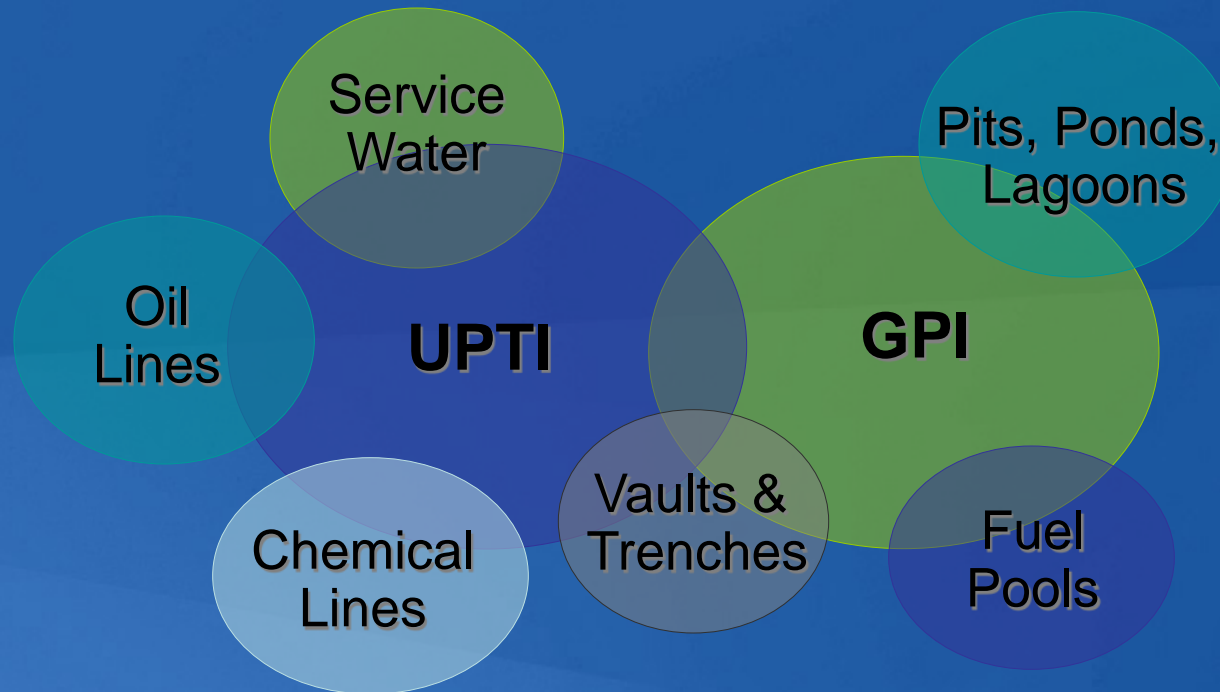
- **NEI 09-14 “Guideline for the Management of Buried Piping Integrity” – January 2010**
 - 1. Establish procedures and programs – June 2010**
 - 2. Perform risk ranking – December 2010**
 - 3. Develop inspection plan – June 2011**
 - 4. Complete inspections – June 2013**
 - 5. Establish asset management plan – December 2013**

- **Collaborative effort between NEI, EPRI, INPO, plants**

Underground Piping and Tanks Integrity Initiative

- **NSIAC approved expanded scope in September 2010**
 - **Underground piping and tanks whether or not they are in direct contact with the soil if they are outside of buildings and**
 - **Contain licensed radioactive material or**
 - **Are safety related**
- **Milestones for NEI 09-14 rev 1**
 - 1. Procedures and oversight by December 31, 2011**
 - 2. Prioritization by June 30, 2012**
 - 3. Condition assessment plan by December 31, 2012**
 - 4. Plan implementation by June 30, 2013**
 - 5. Condition assessment of components containing licensed material by June 30, 2013**
 - 6. Asset management plan by December 2014**

Initiatives – Common Ground



The Ground Water Protection Initiative (GPI) and Underground Piping and Tanks Integrity Initiative (UPTI) have similar objectives and some overlapping activities

Future Activities

- **Implement industry initiatives in a committed and enduring fashion**
- **Coordinate with UPTI/BPI to improve efficient, effective implementation of the Initiatives**
- **GPI: NEI-sponsored peer assessments: round 2**
- **Engage and participate in development of policy changes, regulations, and regulatory guidance**
- **Continued operation, license renewal, new plant development requires that we maintain the trust and confidence of our stakeholders**