Public Workshop on Groundwater Related Policy Issues

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The Current Framework for Groundwater Protection at Commercial Nuclear Power Plants is Established by the Voluntary "Industry Groundwater Protection Initiative" (NEI 07-07)

U.S. NRC Oversight

The NRC assesses each licensee's voluntary implementation of NEI 07-07 at each operating nuclear power plant in accordance with NRC Inspection Manual, Temporary Instruction 2515/173

NEI 07-07 Action 1
Establish a Groundwater Protection Program

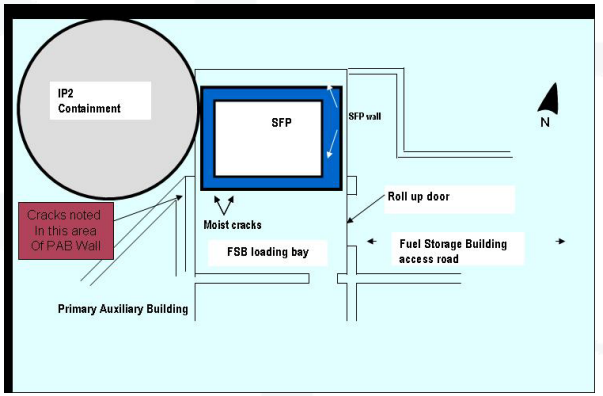
- NEI 07-07 refers to EPRI's "Groundwater Protection Guidelines for Nuclear Power Plants" to assist utilities in implementing a groundwater protection program.

Industry Experience

- At sites with identified groundwater contamination
  - Incidents have been aggressively investigated and effectively resolved, using various techniques:
    - Drilling monitoring wells
    - Deploying data-logging pressure transducers and temperature probes to map hydraulic head and temperature gradients
    - Using robotics to inspect drains, pipelines & tanks
    - Completing down-hole & surface geophysical surveys
    - Sampling Soil Vapor and analyzing for tritium
    - Determining age of tritium in groundwater
    - Analyzing soil and groundwater for various radionuclides
    - Conducting groundwater pumping tests and tracer tests
    - Simulating aquifer response by constructing numerical groundwater flow models

Industry Experience (continued)

- Effective Remediation Methods Include:
  - Source removal
  - Construction of impermeable liners
  - Hydraulic control by pump and discharge
  - Monitored natural attenuation



NEI 07-07 Action 2: Voluntary Communication

- Communication to external stakeholders of inadvertent leaks or spills is required regardless of risk
- Investigations are “slow”. Cannot yield answers quickly, regardless of public pressure to provide prompt solutions.
- A groundwater protection program, including proactive characterization of site hydrogeology and routine monitoring of groundwater quality, provides rational data for a technical basis to respond to leaks and spills -- if it is implemented before they occur.

Are Additional Requirements for Design, Operation and Maintenance Appropriate ?

- In new plants –
  - Minimize buried pipes / provide secondary containment
  - Provide liners for all sumps
- In existing plants - Provide for isolation, inspection and testing of sections of buried/inaccessible pipelines
  - To allow easier location of leaks by:
    - Pressure testing
    - Sampling and analysis of contents
    - Tracer testing
    - NDE methods

Is Applying the ALARA Concept to "Unmonitored Releases" and to Restricted Areas Feasible ?

- Use available resources to monitor GW near SSCs that are potential sources of GW contamination, rather than at plant boundary
- Detection monitoring only near the outer boundary of the restricted area does not provide ALARA
  - Allows GW contaminants to flow over larger area before detection
  - Provides shorter reaction time before flow off site
  - May not identify specific leaking SSCs