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SVP-06-061

July 31, 2006

Mr. Stuart A. Richards, Deputy Director  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject:            Groundwater Protection – Data Collection Questionnaire

Docket Nos.: 50-254 and 50-265


Dear Mr. Richards:

The nuclear industry, in conjunction with the Nuclear Energy Institute, has developed a questionnaire to facilitate the collection of groundwater data at commercial nuclear reactor sites. The objective of the questionnaire is to compile baseline information about the current status of site programs for monitoring and protecting groundwater and to share that information with the NRC. The completed questionnaire for Quad Cities Nuclear Power Station is enclosed.

This submittal contains no new regulatory commitments.

Should you have any questions concerning the enclosed information, please contact Ms. Vicki Neels at (309) 227-3200.

Respectfully,



Timothy J. Tulon  
Site Vice President  
Quad Cities Nuclear Power Station

Enclosure

cc:    U. S. NRC – Document Control Desk  
      Regional Administrator – NRC Region III  
      U. S. NRC Project Manager – NRR  
      NRC Senior Resident Inspector – Quad Cities Nuclear Power Station  
      Ralph Andersen, Nuclear Energy Institute

**Industry Groundwater Protection Initiative  
Voluntary Data Collection Questionnaire**

**Plant:** Quad Cities Nuclear Power Station

**1. Briefly describe the program and/or methods used for detection of leakage or spills from plant systems, structures, and components that have a potential for an inadvertent release of radioactivity from plant operations into groundwater.**

- As part of a fleet-wide systematic assessment, Quad Cities Station performed a technical review of each plant system and structure to determine if inadvertent releases from these systems could potentially impact the environment. Each system was evaluated and those system components that contain or could potentially contain radioactively contaminated liquids were identified and assessed to determine if a potential pathway to the environment existed. A cross-functional collegial team made up of personnel from Operations, Engineering, Chemistry, and Radiation Protection performed the technical review.
- The plant systems, structures, processes, and components that have a potential for an inadvertent release are routinely monitored to detect leakage or spills through an expansive radiation monitoring system (RMS), operator rounds and employee observations. Additionally, engineering control systems such as secondary containment, spill prevention, overflow detection and leak detection are used to detect and prevent releases from entering the environment.
- Examples of the surveillance programs and engineering controls employed at Quad Cities are provided below:
  - Quad Cities has a Fuel Pool Leakage detection system, which would indicate any leakage from its fuel pools.
  - Operations personnel perform routine surveillance rounds each shift. These rounds include the requirement to identify and report leaks and spills. Leaks and spills are addressed through: immediate clean-up, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - System Engineers perform periodic walkdowns of the systems for which they are responsible. These rounds include the requirement to identify and report leaks and spills. Leaks and spills are addressed through: immediate clean-up, notifying supervision for assistance, writing a work request or initiating a Corrective Action Report.
  - Operational groundwater wells are sampled for tritium semiannually.

**2. Briefly describe the program and/or methods for monitoring onsite groundwater for the presence of radioactivity released from plant operations.**

- As part of the fleet wide assessment, Quad Cities installed nine (9) onsite groundwater monitoring wells in addition to the thirteen (13) existing wells that will be periodically sampled and analyzed for radionuclides. These wells encircle the site.

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- The Lower Limits of Detection (LLDs) used during the fleet wide assessment were:

Nuclide	Typical MDA (pCi/l)
Tritium (H-3)	200
Total Strontium – 89/90	2
Manganese (MN-54)	15
Ferrous Citrate (FE-59)	30
Cobalt (CO-58)	15
Cobalt (CO-60)	15
Zinc (ZN-65)	30
Zirconium (ZR-95)	15
Niobium (NB-95)	15
Cesium (CS-134)	15
Cesium (CS-137)	18
Barium (BA-140)	60
Lanthanum (LA-140)	15

**3. If applicable, briefly summarize any occurrences of inadvertent releases of radioactive liquids that had the potential to reach groundwater and have been documented in accordance with 10 CFR 50.75(g).**

- The Quad Cities Station records inadvertent release of radioactive liquids in accordance with 10 CFR 50.75(g). As part of the fleet wide assessment, a third party environmental engineering firm was contracted to evaluate historic releases, if any, and determine if a potential pathway to the environment existed. Those releases that were determined to have potentially impacted groundwater were subsequently investigated as part of the fleet wide assessment. Based on the results of the hydrogeologic investigation, the historical releases that may have a current impact on groundwater are:
  - August 1975 – a Unit 2 feedwater leak released contaminated water to the soil east of the TW-2 roll-up door.
  - December 1979 – a leak to the blacktop east of the Unit 1 Reactor Building, which occurred while draining the 2B Residual Heat Removal Heat Exchanger.
  - March 1986 – a leak from the Integrated Leak Rate Compressor onto the asphalt east of the Unit 1 Reactor Building.
- A copy of the detailed Quad Cities hydrogeologic investigation report will be provided to the NRC.

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- 4. If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring result indicating a concentration in groundwater of radioactivity released from plant operations that exceeds the maximum contaminant level (MCL) established by the USEPA for drinking water.**
- Tritium was detected in one of the 11 groundwater monitoring wells, above the USEPA drinking water standard of 20,000 pCi/L. The concentration of tritium detected in this on-site well was 32,000 pCi/L. No gamma emitting radionuclides or Strontium-89/90 was detected in any of the groundwater wells. Additional monitoring wells have been installed and sampled to characterize the extent of the tritium detected in this single well. Characterization efforts will be documented and provided to the NRC and Illinois Environmental Protection Agency as part of the fleet wide assessment.
- 5. Briefly describe any remediation efforts undertaken or planned to reduce or eliminate levels of radioactivity resulting from plant operations in soil or groundwater onsite or offsite.**
- Past remediation has included excavating and removing soil in the areas of spills.