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

Edwin I. Hatch Nuclear Plant
Joseph M. Farley Nuclear Plant
Vogtle Electric Generating Plant
Groundwater Protection – Data Collection Questionnaire

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 NRC. The completed questionnaire for the Edwin I. Hatch Nuclear Plant (HNP), the Joseph M. Farley Nuclear Plant (FNP) and the Vogtle Electric Generating Plant (VEGP) is enclosed.

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,

Jeffrey T. Gasser

JTG/MBL/sdl

Enclosure: Data Collection Questionnaire for HNP, FNP and VEGP

cc: Southern Nuclear Operating Company
Mr. H. L. Sumner, Jr., Vice President – Plant Farley
Mr. L. M. Stinson., Vice President – Plant Hatch
Mr. D. E. Grissette, Vice President – Plant Vogtle
Mr. J. R. Johnson, General Manager – Plant Farley
Mr. D. R. Madison, General Manager – Plant Hatch
Mr. T. E. Tynan, General Manager – Plant Vogtle
Mr. M. Godfrey, Environmental Affairs Manager
Mr. D. A. Hostetter, Radiological Services Supervisor
RType: CFA04.054; CHA02.004; CVC7000; LC# 14464

U. S. Nuclear Regulatory Commission
Dr. W. D. Travers, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. C. Gratton, NRR Project Manager – Hatch
Mr. C. Gratton, NRR Project Manager – Vogtle
Mr. C. A. Patterson, Senior Resident Inspector – Farley
Mr. D. S. Simpkins, Senior Resident Inspector – Hatch
Mr. G. J. McCoy, Senior Resident Inspector – Vogtle

Nuclear Energy Institute
Mr. Ralph Andersen

Industry Groundwater Protection Initiative
Voluntary Data Collection Questionnaire

Plant: Edwin I. Hatch Nuclear Plant

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.**

    - Operations performs inspection tours of outside equipment and locations on a routine basis checking for unusual conditions.
    - Plant maintenance schedules require periodic inspections and preventative maintenance on outside equipment.
    - Water collected in moats around radioactive water storage tanks requires sampling and analysis prior to disposition.
    - Chemistry has procedures requiring piezometer and test well sampling for groundwater monitoring (see details in section 2 below).
    - An engineering firm has been contracted to perform radioactive underground piping integrity scans. This has been partially completed.

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

    The following are onsite locations sampled for groundwater/surface water on a routine basis:
    - Yard drain outfall discharges
    - Yard drain sumps
    - Subsurface drain outfall discharges
    - Selected piezometer wells inside and outside of protected area
    - Installed test wells inside the protected area
    - Service water side of heat exchangers on radioactive systems that have had leaks in the past
    - Onsite drinking water wells

    Additional special sample locations infrequently sampled:
    - Roof runoffs
    - Creeks
    - Culvert runoffs
    - Outlying site piezometer wells
    - Subsurface drain systems via manways

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).**
    - Underground radioactive liquid line break due to settling of building foundation
    - Abandoned underground line found releasing radioactive water
    - Outside radioactive water storage tank transfer pump seal failures
    - Spent fuel pool expansion bellows deflated releasing a large amount of water outside of buildings

- Leaks from outside radioactive water tanks and components put water into surrounding moats which had openings allowing water to leak onto the soil
- Demineralized water isolation valve failure occurred releasing demineralized water which overflowed a contaminated area curb onto the surrounding soil
- Outside radioactive water tank transfer pump piping deteriorated releasing water through moat penetrations directly into soil below the pump concrete moat

4. **If applicable, briefly summarize the circumstances associated with any <u>onsite</u> or <u>offsite</u> 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.**

   Various radioactive water leaks over the years, released varying amounts of tritiated water onto and into the soil. Some of this water tritium was at concentrations exceeding EPA's drinking water standard. Over the years, a few onsite test/piezometer wells located near the leaks indicated tritium greater than EPA's drinking water standard. Some of this water gradually migrated through the surrounding soil into a subsurface "French drain" system which comes to the surface through an "outfall" which then discharged to a gulley and into the river. Over the years, a few of the subsurface outfall samples indicated tritium exceeding the EPA drinking water standard although no measurable tritium was detected in the river.

   In addition, a yard drain system emptying into another outfall has had tritium in it occasionally when it has flow. A couple of samples from it over the years have shown tritium levels exceeding the EPA's drinking water standard, but no measurable tritium was detected in the river.

   Gamma spectroscopy analyses and Sr-89/90 analyses have not shown any indication of any other nuclides being present in the outfall or well samples.

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.**

   - Formed a tritium issues team composed of chemistry, engineering, management, and corporate radiological staff to scope out and implement action recovery plans
   - Enhanced groundwater well and outfall sampling programs and included drinking water wells
   - Increased groundwater analytical requirements to include gamma emitters and Sr-89/90
   - Purchased a tritium analyzer for faster turnaround on samples
   - Calculated inadvertent tritium released for 2005 and put a statement into the 2005 Radioactive Effluent Release Report
   - Removed insulation from outside radioactive tanks, valves and pumps to inspect for above ground leaks
   - Isolated and repaired visible leaks found which were contributing to groundwater tritium inventory
   - Applying sealants to concrete moat surfaces and sealing any moat openings
   - Obtained the services of a hydrologist to evaluate the groundwater tritium plume and to make recommendations for tracking the plume

- Hired underground piping engineering firm to perform ultrasonic underground piping integrity evaluations of all underground radioactive piping
- Notified public and local officials about tritium releases from the plant
- Met with the Georgia Department of Natural Resources Environmental Protection Division to discuss the plant's groundwater tritium issues
- Installed a catch tank, flow totalizer, and automatic sampler on the subsurface drain line outfall. The tank is pumped to the normal liquid radwaste discharge dilution line.
- Updated the ODCM and procedures to incorporate the affected subsurface drain outfall into a permitted effluent release path
- Modifying the pathway discharge for the surface yard drain containing tritium to allow accurate flow rate measurement and representative sampling.
- Updating the ODCM and procedures to incorporate the affected surface yard drain outfall into a permitted effluent release path
- Obtained water dye for doing investigations into possible cross talk between yard drains and subsurface drains – testing ongoing
- Opening sealed subsurface drain line manways to attempt to localize the source of tritium into the system.
- Pumping water out of three piezometer wells with the highest tritium levels to see if this will significantly reduce the largest source term of tritium already in the groundwater.
- Investigating possible source(s) of tritium into the surface yard drain system
- Communicated tritium issues to the site employees
- Studying long range plan for underground piping surveillance
- Evaluating long term corrective actions for monitoring and controlling effluent streams from the yard and subsurface drain systems including the possibility of adding additional wells and collection of all yard drain effluents
- Weekly tritium issues meetings
- Maintaining communication with NRC and State representatives

Industry Groundwater Protection Initiative
Voluntary Data Collection Questionnaire

Plant: Joseph M. Farley Nuclear Plant

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.**

    - Tell-tale drains on spent fuel pool liners are used to monitor for leakage from the pool liners
    - System Operators and Health Physics shift personnel perform periodic walk downs of outside equipment and locations including radioactive water storage tanks, radwaste processing areas, etc. Any leaks or spills would be immediately reported and entered into the corrective action program.
    - Periodic preventative maintenance is performed on outside equipment with inspections of radioactive systems and components.
    - When water is found in moats around the outside radioactive water tanks, the water is sampled for radioactivity and the tank and associated piping are checked for leaks.
    - The containment buildings have underground tendon access "galleries" which go down to the top of the containment slabs. Ground water intrusion into these areas is pumped by sump pumps to surface yard drains. This water is sampled every calendar quarter for gamma emitters and tritium.
    - Protected area yard drains are sampled if an accidental unplanned release of radioactivity to them should occur.
    - The site FSAR identifies a few observation wells to be used for checking groundwater should the need arise. Plans are being made to locate and sample these wells.

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

    Site drinking water wells are sampled periodically for radioactivity. Plans are being developed to implement a groundwater sampling program in addition to the containment access gallery sump sampling and yard drain sampling programs mentioned previously. Piezometer wells are being evaluated for representative sampling capabilities. In addition, documents such as the site Environmental Plan and FSAR are being reviewed for any applicable groundwater information such as potentiomentric maps, hydrological studies, etc.

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).**

    - During earlier years of operations during transfer of resins, sludges, waste evaporator bottoms, and dewatering liquids to a concrete radwaste pad, some spills of radioactive fluids occurred on the concrete processing pad which had some small cracks. Some of the radioactive fluids seeped through the cracks and penetrated into the ground. The ground was left in place when the pad was torn up and a new solidification building was built on top of the area.

- A Radioactive liquid effluent release line broke underground causing water to rise to the surface and be detected near the Unit 2 reactor makeup water storage tank. The leaking pipe was repaired. The affected soil which registered activity was drummed up for shipment to an offsite radwaste processing facility.
- The Unit 1 steam generator blowdown discharge line leaked underground allowing slightly contaminated water to seep into the ground on the south side of the snubber test building. The leak was repaired. The affected soil which registered activity was drummed up for shipment to an offsite radwaste processing facility.

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.**

   Not Applicable

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.**

   See responses to question 3 above.

Industry Groundwater Protection Initiative
Voluntary Data Collection Questionnaire

Plant: Vogtle Electric Generating Plant

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.**

   - Operations personnel perform routine surveillance rounds each shift monitoring for leaks and spills. Leaks and spills are documented using the corrective action program and are immediately addressed for short and long term corrective actions. In addition, a daily water balance procedure is performed to monitor for reactor coolant system leakage and liquid radwaste tank levels are monitored daily.

   - Chemistry personnel are trained to observe for system leaks during routine sampling of outside systems. They routinely sample potentially radioactive outside tanks. Water from moats surrounding these potentially radioactive outside tanks is sampled and analyzed for radioactivity and then routed for proper disposal.

   - Health Physics personnel perform routine surveys of outside areas including landfills to ensure radioactive materials have not been released to the environment. They monitor water levels in moats surrounding outside radioactive tanks and obtain samples for analysis. They perform routine integrity monitoring of outside containers storing radioactive and potentially radioactive material.

   - Routine samples of yard drains are analyzed for radioactivity. Positive results are documented using the corrective action program. Actions to identify and remediate the spills are immediately initiated and investigations are made to determine the cause and long term resolution of the problem.

   - The site utilizes a Spent Fuel Leakage Detection System which monitors for leaks from the Spent Fuel Pools.

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

   - There are 5 observation wells in the plant protected area. These wells are currently monitored for water level and are being evaluated for availability in a groundwater radioactivity sampling and monitoring program.

   - Additionally, there are observation wells outside of the protected area on the underground downstream gradient from the plant. These wells are also being evaluated for availability in a groundwater radioactivity sampling and monitoring program.

   - Previously contaminated and cleaned up yard drain sumps are being sampled biannually.

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).**

- In the early 1990's, the moat surrounding the Unit 2 Refueling Water Storage Tank developed a leak resulting in contamination of soil in the immediate area. Soil was removed returning the area to environmental release criteria. The moat was repaired and sealed to prevent future leaks.

- In 1992, approximately one gallon of contaminated liquid was inadvertently spilled in a yard drain during handling of radioactive equipment. Personnel immediately isolated the yard drain preventing offsite release and the drain was cleaned of radioactive material.

- In 1994-1995, an outside temporary storage tank containing radioactive material from processing of the Spray Additive Tank leaked behind the Alternate Radwaste Building. Storm drains were dammed preventing offsite release of the material and then cleaned. Contaminated concrete was removed from the area. Trace contamination of soil is planned to be remediated during decommissioning. Trace contamination in the associated yard drain samples was detected during routine yard drain sampling in 2006 and determined to be from the earlier event. The yard drain contents have been cleaned to environmental release criteria.

- Permitted radioactive releases via the Waste Water Retention Basin, a normal plant discharge point, have resulted in trace contamination of sludge on the basin floor. The first of the two basins was cleaned in 2005 while the second is scheduled for cleaning in the near future. Past spills which have occurred around the basins have been cleaned to environmental release criteria.

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.**

   Not applicable

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.**

   See response to Question 3.