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Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Beaver Valley Power Station, Units 1 and 2
Docket Nos. 50-334 and 50-412

Davis-Besse Nuclear Power Station, Unit 1
Docket No. 50-346

Perry Nuclear Power Plant, Unit 1
Docket No. 50-440

SUBJECT: Groundwater Protection – Data Collection Questionnaire

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 questionnaires for the Beaver Valley Power Station, Davis-Besse Nuclear Power Station, and Perry Nuclear Power Plant are provided as Attachments 1, 2, and 3, respectively.

As indicated in Attachment 4, there are no commitments included in this response. If there are any questions or additional information is required, please contact Mr. Gregory A. Dunn, Manager – Fleet Licensing, at (330) 315-7243.

Sincerely,

Gary R. Leidich

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Attachments:

1. Beaver Valley Power Station Response to Groundwater Protection – Data Collection Questionnaire

2. Davis-Besse Nuclear Power Station Response to Groundwater Protection – Data Collection Questionnaire

3. Perry Nuclear Power Plant Response to Groundwater Protection – Data Collection Questionnaire

4. Regulatory Commitments

cc: Stuart A. Richards, Deputy Director, DIRS, NRC
NRC Region I
NRC Region III
NRC Project Manager – Beaver Valley Power Station
NRC Project Manager – Davis-Besse Nuclear Power Station
NRC Project Manager – Perry Nuclear Power Plant
NRC Resident Inspector – Beaver Valley Power Station
NRC Resident Inspector – Davis-Besse Nuclear Power Station
NRC Resident Inspector – Perry Nuclear Power Plant
Ralph Andersen, Nuclear Energy Institute

Industry Groundwater Protection Initiative Questionnaire

Plant: Beaver Valley Power Station (BVPS)

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.**

   Inside and outside plant tours are conducted each shift by the Plant Operators. Operators are required per procedure to report any abnormalities (such as leaks, spills, or other radiological issues) to the Senior Reactor Operator and document the deficiency. Additionally, operators take level readings on inside and outside tanks in accordance with frequencies specified by the applicable procedure. Although not specific to plant operation, tours are also performed by Site Protection personnel per the site protection procedures, and by Chemistry personnel per environmental monitoring requirements.

   The spent fuel pool has a stainless steel liner and is equipped with a leak chase system and tell-tale drain connections that flow to a drain tank. The tell-tale drains are monitored daily for leakage.

   The Catch Basin System (storm drain) is sampled routinely for intrusion of radioactive liquid. Some catch basins are sampled weekly, some quarterly, and some annually. The samples are analyzed for principal gamma emitters and tritium.

   The BVPS Radiological Environmental Monitoring Program (REMP) obtains shoreline sediment samples near the plant discharge on the Ohio River and compares results with samples obtained from upstream and downstream of the site. This is performed every six months per plant procedures.

   Issues identified through normal site programs and methods are entered into the Corrective Action Program for resolution and trending.

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

   With respect to onsite monitoring, BVPS Units 1 and 2 do not have any active onsite wells that are tested for tritium intrusion to the groundwater. However, as described in the response to question 1, the Catch Basin System is sampled routinely for intrusion of radioactive liquid. Certain catch basins (storm drains) are sampled on a weekly basis, while other catch basins are sampled on a quarterly or annual basis. The samples are analyzed for principal gamma emitters and tritium.

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).**

Since 1977, there are nine incidents recorded in Beaver Valley's 10 CFR 50.75(g) file.

Three incidents involve spillage from the Unit 1 Primary Grade Storage Water Tank to the surrounding soil.

Two incidents involve water leaking from the Refuel Water Storage Tank; one leak was from the tank to the surrounding soil while the other leak was from a connected system to the plant foundation.

Two records involve leakage from the Liquid Waste Storage Tank. One leak was the result of freeze damage on the recirculation line while the other leak was a very minor release onto the asphalt adjacent to the tank.

The remaining two incidents involve radioactive water that was inadvertently pumped from plant sumps to the Catch Basin System.

The aforementioned incidents did not result in groundwater radioactivity above USEPA maximum contaminant levels (MCL) for drinking water. Appropriate radiological control practices were implemented per current procedures and regulations, and corrective actions were taken. Documentation is in accordance with 10 CFR 50.75(g).

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.**

There have been no instances of radioactivity released from BVPS Unit 1 and 2 that resulted in groundwater concentrations exceeding the USEPA maximum contaminant level.

During a typical year, a total of six offsite groundwater samples are collected and analyzed for tritium and principal gamma emitters. The samples are collected on a semi-annual basis from three locations within four miles of the site. The three wells are located in Shippingport, PA, Hookstown, PA, and Georgetown, PA. All historical analyses validate that offsite groundwater tritium is normally at or less than the pre-operational value of 300 pCi/l.

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.**

All instances of leaks or spills from plant operations that could result in radioactivity present in the soil or groundwater were documented in accordance with the requirements of 10 CFR 50.75(g). No other remediation efforts are anticipated prior to decommissioning activities.

Industry Groundwater Protection Initiative Questionnaire

Plant: Davis-Besse Nuclear Power Station (DBNPS)

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.**

Inside and outside plant tours are conducted each shift by the Plant Operators. Operators are required per procedure to report any abnormalities (such as leaks, spills, or other radiological issues) to the Senior Reactor Operator and document the deficiency. Additionally, operators take level readings on inside and outside tanks in accordance with frequencies specified by the applicable procedure. Although not specific to plant operation, tours are also performed by Site Protection personnel per the site protection procedures, and by Chemistry personnel per environmental monitoring requirements.

Davis-Besse has a leak detection system under the Spent Fuel Pool (SFP), the Cask Pit (CP), and the Fuel Transfer Canal (FTC). A test is performed monthly to establish the leak rate.

All rainwater within the Protected Area is routed to catch basins, which exit the Plant Protected Area through a continuous radiation monitor. Any inadvertent spills of radioactive material that would enter the Storm Sewer System would be detected by this monitor. Additionally, grab samples downstream from this location are analyzed by Chemistry on a weekly basis for principal gamma emitters and tritium.

The Davis-Besse Nuclear Power Station (DBNPS) Radiological Environmental Monitoring Program (REMP) obtains shoreline sediment samples near the plant discharge, and compares results with samples obtained in control locations away from the site. This is performed every six months per plant procedures.

A well on the south side of the facility is periodically sampled for radioactivity in accordance with the Repetitive Maintenance Program.

Issues identified through normal site programs and methods are entered into the Corrective Action Program for resolution and trending.

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

With respect to onsite groundwater monitoring, in 2004, a well on the south side of the facility was sampled for radioactivity to determine if any leakage was coming from the SFP, CP, or the FTC. Through the Corrective Action Program, sampling of the well has been added to the Repetitive Maintenance program for ongoing radioactivity monitoring.

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 10 CFR 50.75(g) file at DBNPS contains four incidents. Each incident is described below.

Following a primary to secondary leak, contaminated secondary resin was transferred to the South Settling Basin, where it remains. The Davis-Besse South Settling Basin was designed to accept spent resin from backwashed secondary polishing demineralizers. Spent resins from the secondary polishers are no longer directed to this basin.

Water from the Backwash Receiver Tank leaked into the ground from a break in a 3-inch line located between the Backwash Receiver Tank and the South Settling Basin. The line break was excavated and repaired, and 7 cubic yards of contaminated soil was sent to a disposal facility.

Primary grade water was spilled onto the ground near the Borated Water Storage Tank while draining the Hydrogen Addition System. Approximately 20 cubic yards of contaminated soil was excavated from the area and shipped to a disposal facility.

While pumping water from the North Settling Basin to the Collection Box, the discharge hose from the pump fell out of the Collection Box and spilled water containing low-level tritium (<1E+04 pCi/L) onto the ground.

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.**

   There have been no instances of radioactivity released from DBNPS that resulted in groundwater concentrations exceeding the USEPA maximum contaminant level.

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.**

   A leak was found in the line between the Backwash Receiver Tank and the South Settling Basin. Following the excavation and repair of the broken line, 7 cubic yards of contaminated soil were removed and shipped to a disposal facility. Some contaminated soil from this leak remains in place. Detectable levels of Cs-134 and Cs-137 remain in the soil. Based on a study of the area by a consulting expert, the dose to onsite workers is <1 mrem/year.

   Draining of Hydrogen Addition System caused a spill of primary grade water. The soil was excavated to a depth where radioactive material was no longer detected with field instruments, and approximately 20 cubic yards of contaminated soil waste was removed and shipped to a disposal facility. Core samples from the floor and the sides of the excavation were analyzed and contained detectable Co-58/60 and Cs-134/137 at low levels. Seven wells in this vicinity were sampled for gamma activity and tritium. There was no gamma activity above detection levels. Tritium levels ranged from 250 pCi/L to 2410 pCi/L, and averaged approximately 1000 pCi/L. Based on a radiological evaluation of the area, the dose to onsite workers is <1 mrem/year.

   All other instances of leaks or spills from plant operations that could result in radioactivity present in the soil or groundwater were documented in accordance with the requirements of 10 CFR 50.75(g). No other remediation efforts are anticipated prior to decommissioning activities.

Industry Groundwater Protection Initiative Questionnaire

Plant: Perry Nuclear Power Plant (PNPP)

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.**

Inside and outside plant tours are conducted each shift by the Plant Operators. Operators are required per procedure to report any abnormalities (such as leaks, spills, or other radiological issues) to the Senior Reactor Operator and document the deficiency. Additionally, operators take level readings on inside and outside tanks in accordance with frequencies specified by the applicable procedure. Although not specific to plant operation, tours are also performed by Site Protection personnel per the site protection procedures, and by Chemistry personnel per environmental monitoring requirements.

The PNPP Spent Fuel Pool is lined with stainless steel to provide a high degree of integrity. Interconnected drainage paths located behind the liner welds are designed to prevent the uncontrolled loss of contaminated pool water and provide liner leak detection and measurement. The leak detection system is monitored weekly.

With respect to groundwater monitoring, PNPP has an Underdrain System to prevent the buildup of groundwater hydrostatic pressure on plant structures. As the purpose of the system is to transfer groundwater away from plant structures, the system also provides a method to monitor any plant leaks that could otherwise be entering the groundwater. The Underdrain System has two continuous radiation monitors installed, which monitor the process stream prior to flowing into the Emergency Service Water (ESW) System. Furthermore, the system is sampled and analyzed for principal gamma emitters and tritium on a quarterly basis per chemistry procedures.

The PNPP Radiological Environmental Monitoring Program (REMP) obtains shoreline sediment samples near the plant discharge, and compares results with samples obtained in control locations away from the site. This is performed every six months per plant procedures.

Issues identified through normal site programs and methods are entered into the Corrective Action Program for resolution and trending.

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

With respect to onsite groundwater monitoring, PNPP has an Underdrain System to prevent the buildup of groundwater hydrostatic pressure on plant structures. As the purpose of the system is to transfer groundwater away from plant structures, the system also provides a method to monitor any plant leaks that could otherwise be entering the groundwater. The Underdrain System has two continuous radiation monitors installed, which monitor the process stream prior to flowing into ESW. Furthermore, the system is sampled and analyzed for principal gamma emitters and tritium on a quarterly basis per chemistry procedures.

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

The 10 CFR 50.75(g) file for PNPP includes a description of a history of ESW forebay silt contamination that led to contamination detected in a minor stream on the east side of the plant as well as subsequent storage of the contaminated silt in the Chemical Waste Lagoon.

In addition to the ESW forebay silt history, three other instances are included in the 10 CFR 50.75(g) file. Each instance is described below.

A contaminated sediment sample was obtained from the area of the Northwest Drain Impoundment, which accepts storm drain water from the west side of the plant. The source of the contamination was unknown. The Northwest Drain Impoundment area is monitored on a semiannual basis.

Contaminated soil was discovered adjacent to a Sealand container located outside of the plant buildings, which was storing radioactive components used during refueling outages.

Contaminated water from the Feedwater System leaked into the Underdrain System. An investigation determined leaks from plant systems migrated through seismic gaps between plant buildings to the Underdrain System.

4. **If applicable, briefly summarize the circumstances associated with any onsite or offsite groundwater monitoring results 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.**

   In March 2006, a quarterly liquid grab sample from the Underdrain System contained detectable levels of tritium. A problem-solving team determined that leaks from plant systems migrated through seismic gaps between plant buildings to the Underdrain System. No other nuclides were detected. The highest tritium concentration detected in the site Underdrain System was 59,500 pCi/liter. The USEPA drinking water MCL for tritium is 20,000 pCi/liter. The Underdrain System routes groundwater to the Emergency Service Water System. From the Emergency Service Water System, the tritiated water was processed in accordance with site procedures for effluent releases, which includes steps to ensure the effluent concentrations are below any legal limits.

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.**

   All instances of leaks or spills from plant operations that could result in radioactivity present in the soil or groundwater were documented in accordance with the requirements of 10 CFR 50.75(g). No other remediation efforts are anticipated prior to decommissioning activities.

Regulatory Commitments

The following list identifies those actions committed to by the FirstEnergy Nuclear Operating Company (FENOC) for the Beaver Valley Power Station, Unit Nos. 1 & 2, Perry Nuclear Power Plant, Unit No. 1, and Davis-Besse Nuclear Power Station, Unit 1 in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Gregory A. Dunn, Manager-Fleet Licensing at (330) 315-7243 of any questions regarding this document or associated regulatory commitments.

Commitment	Due Date
None	N/A