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RBG-47473

June 4, 2014

U.S. Nuclear Regulatory Commission
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SUBJECT: Special Report for NEI 07-07 Notification
River Bend Station
Docket No. 50-458
License No. NPF-47

Dear Sir or Madam:

This special report is being submitted in support of the Nuclear Energy Institute Groundwater Protection Initiative. Under the Initiative, a written report is required within 30 days for all onsite sample results that exceed any of the radioactive effluents reporting criteria, and could potentially reach the ground water which presently is being used as a source of drinking water, or has the potential to become such a source. Currently, the potentially affected aquifer is not used for drinking water down-gradient of River Bend Station (RBS), but is considered potable-quality water, and thus, is considered a potential source of drinking water.

On May 4, 2014, an operator discovered a small amount of water (approximately 2 drops per minute) leaking into a tunnel on the 67-foot elevation of the turbine building through a primary service water (SWP) pipe penetration. The water was initially sampled to determine if the service water line was leaking, but the results indicated that the leak did not originate from the SWP system. On May 9, 2014, the water was sampled for tritium, and a concentration of 2.82 E4 picocuries per liter (2.82 E-5 microcuries per milliliter) was detected. Follow-up sampling confirmed the tritium activity, and the leakage rate was determined to vary from 0.4 milliliters per hour to 10 milliliters per hour. The leakage rate appeared to be affected by rainfall, as it increased during and immediately following a rain, but subsequently returning to 0.4 milliliters per hour after the rain ceased. The concentrations were also affected by the rain, as the activity decreased by a factor of ten after a large rain event. Based on this information, it is believed that the water is coming from outside the tunnel wall. Tritium is the only radioisotope detected thus far. NEI was notified on May 12, 2014.

The grade elevation above the tunnel is 95 feet. The only sources of radioactive material capable of yielding the detected contamination are two small-bore pipes in the tunnel that have been used for liquid radioactive waste discharges, but which are currently out of service. The service water pipes and the liquid waste pipes are all below grade elevation. The leak is located on the top of the pipe that is furthest east at the 72-foot elevation. An above-grade radioactive waste discharge line was installed in 2012, and the two small-bore pipes were taken out of service. The small-bore pipes have not been used for waste discharges since that time.

The small-bore waste discharge pipes are located at the 88-foot elevation, which is about 16 feet above the SWP pipe. These pipes penetrate the tunnel wall and are routed to the circulating water

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system blow-down line. No visible leakage was seen in the tunnel from these pipes. It is possible that these pipes have developed a leak outside the tunnel below grade. Some water may still be in the small-bore pipes, and it may be leaking onto the SWP pipe at the 72-foot elevation.

The leakage into the tunnel is not from the nearest aquifer beneath the site, and this activity has not been detected in a groundwater monitoring well. The bottom of the SWP line is about 11 feet above the water table. The Upland Terrace Aquifer is the closest aquifer beneath the site. The Upland Terrace Aquifer is hydrologically connected to the Mississippi River Alluvial aquifer, and then to the Mississippi River, approximately two miles west of the facility.

A multi-disciplinary team has been assembled to determine the source of the tritium. Non-destructive examination of the two small-bore discharge lines will be performed to determine whether one or both are leaking below grade.

Although they are likely insignificant, potential offsite effects have been reviewed. The site conceptual hydrology model indicates a down-gradient flow generally to the southwest from the turbine building to the Mississippi River. RBS does not use on-site wells for drinking water. The nearest facility that processes Mississippi River water for drinking is many miles downstream below Baton Rouge, Louisiana. Current surveys indicate that no drinking water wells are in the immediate vicinity of the station. Wells supplying the local commercial water utility are up-gradient from the station. The station's geologist estimates that the activity detected in the turbine building tunnel penetration would – due to decay, dilution, and dispersion – likely not be detected if it were to infiltrate to the Upland Terrace Aquifer and migrate to the Mississippi River. Due to the dilution volume of the Mississippi River, there would be no significant effects offsite. RBS has performed an estimated potential and bounding annual dose to a member of the public, and the estimated annualized dose is less than the 10 CFR 50 Appendix I dose limits. This calculation is on file for NRC review.

RBS is communicating with key stakeholders the investigation results, sample activity results, and actions taken to resolve the cause of the leak as this information becomes available.

This letter contains no new regulatory commitments. Should you have any questions concerning this letter, please contact Bill Spell at (225)381-3701.

Sincerely,



EWO/dhw

cc: Regional Administrator
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