From: James Noggle
To: Tbrice@gw.dec.state.ny.us
Date: 3/13/06 8:15AM
Subject: IP2 SIT mention of PCBs at Unit 1

Dear Tim,

As you know, the NRC intends on mentioning the known PCB contamination associated with Unit 1, but since it is outside of NRC jurisdiction, we would like to characterize this appropriately for the State of New York. This will serve 2 purposes: it will keep pressure on Entergy to sample PCBs in the Unit 1 wells, and it justifies waiting until the hydrology study is complete before pumping Unit 2 wells and potentially extending PCB contamination across the site.

The current 2 areas mentioning Unit 1 in our inspection Draft are attached. I may want to add that the Unit 1 water storage pool indicates 700 ppb PCB and the North Curtain Drain influent indicates 1 ppb, is processed through 2 charcoal columns and meets the NYS MDA of <.65 ppb prior to releasing to the discharge canal. What can I say in this area?

Regards,

Jim

CC: Blough, A. Randolph; White, John

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B. Monitoring and Control of Water Inventory in the Unit 1 Spent Fuel Pool System

a. Inspection Scope

The inspectors walked down accessible areas of the North Curtain Drain System (NCDS) and the Sphere Foundation Drain System (SFDS). The inspectors also examined the NCDS effluent treatment system. Additionally, the inspectors toured the Unit 1 spent fuel pool area, observed on going spent fuel inspection work taking place, and noted the water levels in the various spent fuel pools. Unit 1 spent fuel pool leak rate data was reviewed by the inspectors, and discussions were held with licensee individuals regarding the Unit 1 spent fuel pools. During this inspection, the NRC obtained samples of the Unit 1 West Spent Fuel Pool, the NCD, and the SFDS for the purpose of independent analysis. The NCD sample was taken after the NCD treatment system. The samples were sent to the NRC contract laboratory, the Oak Ridge Institute for Science and Education (ORISE), Environmental Site Survey and Assessment Program (ESSAP) radioanalytical laboratory. The preliminary analytical results for the samples indicated that both tritium and Sr-90 were present in the Unit 1 West Spent Fuel Pool and the NCD samples. The SFDS sample contained only tritium. The NCD sample contained tritium at a concentration approximately a factor of 10 below that of the Unit 1 spent fuel pool with the Sr-90 concentration approximately a factor of 1000 below that of the Unit 1 spent fuel pool. The SFDS contained tritium at a concentration approximately a factor of 1000 below that of the Unit 1 spent fuel pool. The complete analytical data is contained in the ORISE report which is attached to this inspection report.

b. Findings and Assessment

No significant findings were identified.

The licensee's efforts to estimate the leak rates from the Unit 1 spent fuel pools were acceptable. The licensee's actions with regard to the Unit 1 spent fuel pool leak rate were well planned and systematic to attempt to identify leakage paths and mitigate leaks. The licensee's future plans call for the dry cask storage of the Unit 1 spent fuel with the subsequent draining of the Unit 1 spent fuel pools. The licensee was monitoring the releases from the systems that collect leakage from the Unit 1 spent fuel pools prior to release to the environment. The releases were included in the licensee's effluent release and offsite dose assessment in accordance with license requirements.

The Unit 1 spent fuel pool system included six interconnecting pools and the water storage pool. The pools can be separated with gates and seals. There are two systems which provide pathways for collection of water leakage from the Unit 1 spent fuel pools. These collection systems were the NCD and the SFDS. In addition, a third system, the South Curtain Drain System, is inoperable. These drain systems provided a primary receptor for any water leaked from the Unit 1 spent fuel pools. The SFDS depressed the ground water below the Unit 1 containment, creating a depression cone, and would intercept any leaks from the bottom of the Unit 1 spent fuel pools. The NCD is hydraulically connected to the

permeable fill placed between the Unit 1 spent fuel pool foundations and the bedrock, and should intercept the Unit 1 spent fuel pool leaks into the permeable fill. The licensee's efforts with regard to Unit 1 spent fuel pool leakage have previously been documented in NRC Inspection Report Numbers 50-03/94-01, 50-03/94-02, and 50-03/94-80.

The NCD water was collected in the Unit 1 spray return moat and processed through a treatment system that included media for the removal of chemical contaminants present in the NCD water, and then through media for the removal of radioactive material. The SFDS water was collected in a sump and discharged via the R-62 radiation monitor.

Both collection systems contained tritium at a concentration below that measured in the Unit 1 spent fuel pool. Additionally, the NCD contained Sr-90 at a concentration below that measured in the Unit 1 spent fuel pool. This was due to the inflow of ground water into these collection systems. The fact that the NCD contained Sr-90 indicated that the Unit 1 spent fuel pool system leak may be into the permeable fill surrounding the NCD, with some small amount of leakage or contamination from the NCD into the SFDS.

6. Onsite Ground Contamination Ground Water Transport and Assessment

a. Inspection Scope

The ground water transport and radiological assessment was based upon several presentations and meetings with the licensee and their geotechnical consultant on: (1) the licensee's evaluation of the extent of the tritium contamination, (2) their Phase 1 effort to locate, install and monitor shallow and deep ground-water monitoring wells, and (3) observations made during field tours of the site. In addition, the licensee provided a "Water Mass Balance and Dose Calculation from Ground Water and Storm Water" draft report, dated February 2006 and the licensee's geotechnical consultant provided an interim report of ground water transport, dated January 25, 2006 that were reviewed. These reports and meetings were used to understand the current state of knowledge of the ground water transport of the radionuclide contaminants and its associated radiological impact. This review tested their site conceptual hydro geologic model and considered alternative explanations for the observed field data. The status of the site conceptual model was reviewed to explain the preferential pathways and properties in which ground-water and contaminants move through the fractures zones; where they behave as water table or confining units, and their connectivity; and ultimately how contaminants migrate offsite to the Hudson River. With respect to understanding the Indian Point site ground water transport, the following areas were under investigation and NRC assessment: (1) identifying contaminant source(s), (2) delineating the transmissive fracture zones, their flow directions and rates, (3) understanding the location and rates of subsurface seepage of the tritium into the discharge canal, and (4) analyzing transport pathways and travel times to the Hudson River.

b. Findings and Assessment

No significant findings were identified.

The initial site ground water transport model prepared by the licensee, as of February 28, 2006 indicates the following results.

Licensee Results

The IPEC site is immediately adjacent to the Hudson River where overall regional ground water flow would be generally towards the river and upwards at depth. This upward ground water flow from depth would confine the tritium to the shallow ground water zone. Ground water flow tends to be along the north-south fracture lines in the bedrock, however plant construction excavation of the bedrock and backfill of the site is expected to allow significant westward drainage to the Hudson River. The site contains numerous subsurface foundation, footer, and storm drain systems. These drain systems are actively depressing the ground water and will influence the direction of ground water flow.

Similar ground water elevations and hydraulic response to drilling activities indicate that the Unit 2 SFP crack MW-30 has a high degree of connection with the monitoring wells in the Unit 2 transformer yard (MW-33, MW-34, MW-35 and MW-111). This indicates

that the identified Unit 2 SFP leak is very likely towards the west into the transformer yard. The other monitoring wells near the Unit 2 SFP crack (MW-31 and MW-32, east and south), have much higher ground water elevations than those already mentioned. This would indicate a low degree of connection with MW-30 and a ground water pressure gradient towards MW-30. Low levels of tritium detected in these two wells is likely due to bedrock fracture lines direction and eastward dip flow direction before reaching the ground water. The vertical or upward ground water gradient has not yet been evaluated. This would determine if lower depth water aquifer is rising near the Hudson River as theorized. Utilizing ground penetrating radar, it was determined that the Unit 2 transformer yard consists of a deep deposit of soil backfill which provides a preferential gound water flow path into the transformer yard. The ground water elevation in the transformer yard is above the storm drain system during periods of rainfall. This indicates that the storm drain piping in the transformer yard acts as a drain for the transformer yard and is a potential source of tritium found in the Unit 2 storm drain system.

The discharge canal lies between the transformer yard and the Hudson River. Monitoring wells MW-36 and MW-37 (east and west of the discharge canal) both indicate tritium contamination from elevations just below the bottom of the discharge canal. This indicates that tritium is migrating past the discharge canal and potentially into the Hudson River. The pathway may be under the discharge canal or past the north end of the discharge canal. Future wells will be installed to further clarify the final ground water pathway offsite.

Assessment

The site is built on a hill that tends to fall off in all directions. The presence of surface water like Meahagh Lake, just a few feet above MSL towards the east, and some small streams in forested land southeast of the site suggests that most groundwater flow under the site would occur from local recharge. The licensee observed a strong vertical gradient in some wells during construction indicates the likelihood of a shallow ground water pathway.

A. Identification of contaminant sources using tracer tests The licensee indicates plans to use organic dyes or other dissolved tracers (e.g., bromide) to identify the tritium sources by systematically introducing these tracers adjacent to or within (where feasible) the potential sources of the leaking tritium (e.g., spent fuel pool, primary auxiliary building components, and tanks). At the time of this report, the tracer test strategy was still under development and had not yet been defined. Introduction of the tracers directly into the plant systems would simulate the leaking water streams and ground-water contamination. Introducing tracers into the subsurface outside of the potential leak(s) might lead to an additional layer of uncertainty because of the lack of knowledge of how the contaminants leaked from the buildings into the subsurface. The use of different tracers at different locations would be used to differentiate the most likely points of contaminant release. It is important that the migration of the tracers should proceed under ambient conditions at the site, rather that under artificial conditions imposed by large-scale pumping of the monitoring wells. **There two reasons why early remediation through pumping is considered detrimental. First, the natural water drainage pathways through the fractured bedrock, would likely change since the hydraulic head would be increased to the well drainage location. This change**

could obscure tracing the leak paths back to their sources, which is the main purpose of this investigation; that of identifying the leak sources and repairing them. Second, the leaking Unit 1 spent fuel pool system is known to contain higher levels of cesium-137 and strontium-90 and may potentially contain PCB contamination (detectable in the North Curtain Drain). Any early uninformed pumping of the ground water could draw these contaminants out of their confined french drain collection system and further contaminate the site unnecessarily.