PSEG Nuclear LLC
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MAY 1 4 2001

PSEG Nuclear LLC

LR-N01-0162
LCR H00-05, Sup. 2

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

**SUPPLEMENTAL ENVIRONMENTAL INFORMATION
IN REGARDS TO REQUEST FOR LICENSE AMENDMENT
INCREASED LICENSED POWER LEVEL
HOPE CREEK GENERATING STATION UNIT NO. 1
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354**

This letter transmits additional environmental information to support the staff's review of the request for license amendment submitted by PSEG Nuclear LLC on December 1, 2000 requesting an increase in licensed power level for Hope Creek Generating Station Unit No. 1.

Should you have any questions regarding this request, please contact Mr. Brian Thomas at (856)339-2022.

Sincerely,

M. B. Bezilla
Vice President - Technical Support

Affidavit
Enclosure

C001

MAY 1 4 2001

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File Nos. 1.2.1 (Hope Creek)
2.3 (LCR H00-05)

REF: LRN-01-0162
LCR H00-05, Sup. 2

STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

M. B. Bezilla, being duly sworn according to law deposes and says:

I am Vice President - Technical Support of PSEG Nuclear LLC, and as such, I find the matters set forth in the above referenced letter, concerning Hope Creek Generating Station, Unit No. 1, are true to the best of my knowledge, information and belief.

Subscribed and Sworn to before me
this 14th day of May, 2001

Notary Public of New Jersey

My Commission expires on June 14, 2003

ENCLOSURE

PSEG NUCLEAR, LLC
HOPE CREEK GENERATING STATION (HCGS)
UNIT NO. 1
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

REQUEST FOR LICENSE AMENDMENT
INCREASED POWER LEVEL (DATED DECEMBER 1, 2000)

SUPPLEMENTAL ENVIRONMENTAL INFORMATION

The Hope Creek Nuclear Generating Station Unit No. 1 Final Environmental Statement (FES-OL), issued on December 1984, evaluated the environmental impact of operating Hope Creek Generating Station (HCGS or Station) Unit No. 1. The conclusions of the Final Environmental Statement are based on review of the information contained in Hope Creek Generating Station Environmental Report – Construction Permit Stage, submitted on November 30, 1973. The following evaluation provides additional environmental information related to the 1.4% power uprate of Hope Creek No. 1.

Section 3.1 (Plant Design and Operation) of the Hope Creek Generating Station Environmental Protection Plan (EPP), Appendix B to the Facility Operating License NPF-57 states that "the licensee may make changes in station design or operation or perform tests or experiments affecting the environment provided such activities do not involve an unreviewed environmental question and do not involve a change in the EPP." Section 3.1 requires that an environmental evaluation be prepared and recorded prior to engaging in any activity which may significantly affect the environment. Section 3.1 further states that, "A proposed change, test or experiment shall be deemed to involve an unreviewed environmental question if it concerns: (1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated in the FES-OL, environmental impact appraisals, or in any decisions of the Atomic Safety and Licensing Board; or (2) as significant change in effluents or power level; or (3) a matter, not previously reviewed and evaluated in the documents specified in (1) of this Subsection, which may have a significant adverse environmental impact."

In accordance with the requirements discussed above, this evaluation assessed the proposed core power level increase from 3293 MWt to 3342 MWt (1.5%) and determined that there is no significant adverse environmental impact. The environmental evaluation considers thermal effects, consumptive uses, particulate emissions, radiological effluents and radwaste. These evaluations, performed at a 1.5% uprated value, bound the 1.4% increase requested in the December 1, 2000, Request for License Amendment.

HCGS is located at approximately River Mile 51 on the Delaware Estuary (River or Estuary). The Station is located on a projection of land known as Artificial Island on the eastern shore of the Estuary. The Estuary in the area of the Station is approximately 2.5 miles wide. The tidal flow past the Station is approximately 400,000 cubic feet per second (cfs) or 259,000 million gallons per day (MGD).

The circulating water system (CWS) is a closed loop system utilizing a, natural draft cooling tower. The CWS contains approximately 9 million gallons of water, recirculated at 550,000 gpm. The CWS is the principal heat sink for normal plant processes. Water is pumped from the cooling tower basin through the main condenser and back to the cooling tower, where heat is rejected by convection and evaporation to the atmosphere. The main condenser is designed to remove waste heat from the steam power cycle and dissipate that heat to the CWS for maximum efficiency. When HCGS is producing full power, approximately 7.7×10^9 BTU/hr of heat is rejected, resulting in a 28 °F temperature rise to the cooling water before its return to the cooling tower where the heat is removed.

The NJPDES Permit NJ0025411 (Permit) imposes limits on the temperature of the discharged blowdown and the amount of heat discharged to the Estuary by the Station. Maximum blowdown temperature is limited to 97.1 °F. Heat rejection is limited to 662 MBTU/hr (1 September through 31 May) and 534 MBTU/hr (1 June through 31 August). The Permit provides relief for excess blowdown temperature when adverse meteorological conditions exceed design values for one or more hours during the day. However, the heat dissipation area (HDA) as regulated by the Delaware River Basin Commission (DRBC) may not be exceeded. During that period hourly monitoring of specific parameters is required. Current Permit discharge limits and DRBC Docket D-73-193 CP (Revised) HDA limits will not be exceeded as a result of the 1.4 % Uprating.

The Service Water Intake Structure (SWIS) consists of four separate operating intake bays. Each of the 4 bays contains a bar-type trash rack, traveling screen with Ristroph fish baskets, fish return trough, service water pump (SWP) and a strainer. Each pump draws water from its own intake bay. Each pump's design rating is 16,500 gpm at 150 feet total developed head (TDH), for a total available design flow of 66,000 gpm. During normal plant operation only two pumps (approximately 33,000 gpm) are in-service. For a limited period of time during normal shutdown, four pumps will be in operation. The quantity of service water withdrawn will not change as a result of the power increase therefore impingement and entrainment impacts previously evaluated in the FES-OL will not change.

During normal operation the Station Service Water System (SSWS) withdraws approximately 47 MGD from the Estuary. The SSWS withdraws water from the Estuary to remove heat from the safety auxiliary cooling system (SACS) and reactor auxiliary cooling system (RACS). The SACS and RACS are closed loop systems thus there is little chance of radiological contamination. The entire flow then discharges into the cooling tower basin and acts as makeup to the CWS.

The evaluated power increase results in a slight temperature (0.4 °F) increase in the cooling range of the tower from 29°F to 29.4°F. (Cooling range is the difference between the hot water entering the tower and the cold water leaving the tower.) This slight increase improves the natural draft of air through the tower, thus also increases the tower's cooling efficiency. This improved draft also results in a slight increase in evaporative losses. Since the service water flow and circulating water flow will remain unchanged, there will be a slight reduction in blowdown flow (with a slight increase in temperature). This results in a heat rejection rate that is less than the heat rejection rate at lower power levels.

Cooling tower evaporative losses vary between 13 and 18 MGD depending on the season. DRBC Docket D-77-110 CP (Amendment 1) requires that compensated releases be made whenever the flow as measured at Trenton, NJ falls below 3,000 cfs for 5 consecutive days. To provide for these releases, PSEG participates in a supplemental water storage reservoir known as the Merrill Creek Reservoir (Reservoir). The change in evaporative losses was evaluated for a 1.5% power uprating. The resultant increase in evaporative losses is expected to be 1.5%. Increased water storage requirements were determined. PSEG's currently owns 13.9% of storage capacity of the Reservoir. PSEG's share of the capacity is sufficient to meet the total compensation release requirements at a 1.5% power uprate, therefore the requested 1.4% power increase is bounded by PSEG's current allocation.

The slight increase in evaporation will result in an increase in particulate emissions to the atmosphere. Total dissolved solids (TDS) in the circulating water affect particulate emissions. TDS is highly variable and dependent on the TDS of the makeup water. The evaluations performed indicate that the slight increase in particulate emissions will remain within the currently permitted maximum allowable annual values. The hourly emission rates are not expected to exceed the hourly emission limits.

The SSWS withdraws water from the Estuary to supply the safety auxiliary cooling system (SACS) and reactor auxiliary cooling system (RACS). The SACS heat exchangers service the SACS and Turbine Auxiliary Cooling System (TACS) during normal operating condition and post accident decay heat removal functions. SACS system was designed and sized to remove post-accident decay heat for a power level of 102%. Design bases heat loads for TACS were based on turbine operation at valves wide-open condition, which is equivalent to approximately a 104% power level. Therefore, the 1.4% power increase and incremental increases in heat is bounded by the original design basis for these systems.

The highest heat load to the SSWS is from the fuel pool cooling and clean up system (FPCCS) heat exchangers when the unit is off-line and the core is off-loaded. The incremental increased heat load when the core is off-loaded is insignificant compared to the heat load from full load power operation.

The RACS system is a closed loop system providing cooling to non-safety related components. As stated in the December 1, 2000 Request for License Amendment,

reactor operating pressure and temperature are not changed for the 1.4 % uprating, and reactor coolant flow will remain within original design limits. Therefore, the 1.4% power increase will not impact the associated heat loads.

The evaluations concluded that the proposed Uprating would not require any modification to the effluent limitations to the existing Permits and will not cause an adverse environmental impact.

To summarize, the 1.4 % power increase and its resultant thermal discharge, consumptive use, and particulate emissions do not change the conclusions that HCGS is not having a significant adverse environmental impact. The slight changes in heat load, temperature, ΔT, consumptive use and particulate emissions remain within the current permit limits and do not require changes to any of the current permitted limitations administered by the NJDEP or DRBC.

Baseline calculations were evaluated to determine potential impacts on radiological effluents as a result of the power uprating. It has been determined that the 1.4% power uprating is bounded by the existing analyses for Control Rod Drop Accident, Loss of Coolant Accident (LOCA) and Fuel Handling Accident. Additionally, Instrument Line pipe Break and Steam System Piping Break Outside Containment source terms are bounded by existing analyses. This was documented in the Request for License Amendment, LCR No. H00-05, dated December 1, 2000.

There are no anticipated changes in the radiological dose to the environment or dose received by the general public as a result of the 1.4% power increase. Current regulations and operating requirement assure that dose to the general public are keep as low as reasonably achievable (ALARA). Implementation of the programs and processes that assure an ALARA concept will not be affected by the power increase. Neither liquid nor gaseous radiation effluent monitoring setpoints will be changed as a result of the power increase. Radioactive effluent releases are closely monitored and controlled by approved programs and procedures.

The release volumes from the gaseous and liquid radiological waste processing systems are not expected to change as a result of the proposed power level change. An infinitesimal increase might occur in concentrations of liquid or gaseous radiological effluent as a result of the power increase. It is also possible that there could be an extremely small increase in the radioactivity levels of demineralizer resins in liquid processing systems. Radioactive demineralizers are processed and shipped as solid radioactive radwaste. All solid radioactive wastes are evaluated and shipped in appropriate shipping container (including shield casks as required, based on radiation level). Thus there is no expected increase in dose to the general population from solid radioactive waste processing, shipping or disposal due to the power level increase.

The requirement imposed in federal regulations specified in 10 CFR 20 and 10 CFR 50, Appendix I (as well as the NRC operating license specifications) assure that there would be virtually no radiological impact as a result of station operation, either at the current

level or the increased level. A continuous dose assessment program that is required by 10 CFR 50, Appendix I, restricts the operation of a nuclear facility to a small fraction of the annual dose that any member of the general public would normally receive from environmental and other manmade sources. The radiological effect of HCGS were evaluated in the Final Safety Evaluation Report, the HCGS Environmental Report, the 10 CFR 50, Appendix I application submittal made in June 1, 1976, as well as in the NRC's Environmental Impact Statement and Safety Analysis Report. The conservative design basis assumptions in these analyses bound the expected radioactive effluent release activity from station operation even above the proposed 1.4% increase.

To assure that there is no radiological dose impact from station operation, a comprehensive environmental radiological monitoring program is in place. The program requires that annual reports be sent to the NRC and made available to the general public that evaluate environmental radiological level. These reports must include documentation of any dose increase to the environment or general public and thus assure no impact to the environment from operation of the HCGS. Likewise, design basis accidents evaluated in the HCGS Environmental Report are bounded by the power level assumed in the present accident analysis.

In conclusion, the environmental effects of thermal discharges, consumptive use, particulate emissions, radiological effluents, radiation dose to the public and radwaste from a 1.5% power increase were evaluated and it is concluded that no significant environmental impact would occur as a result of the power increase. These results bound the effects of the 1.4% power increase requested in the December 1, 2000 License Amendment request. The slight increase in heat load, temperature, ΔT, consumptive use and particulate emissions are within the existing NJPDES and DRBC permit limits. For radiological effluents, radiation dose to the public and radwaste, original parameters remain unchanged or the original evaluations bound the uprated values.