

April 5, 2001

MEMORANDUM TO: James W. Clifford, Chief, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: Richard B. Ennis, Project Manager, Section 2 **/RA/**  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

SUBJECT: HOPE CREEK GENERATING STATION, FACSIMILE TRANSMISSION,  
ISSUES TO BE DISCUSSED IN AN UPCOMING CONFERENCE CALL  
(TAC NO. MB0644)

The attached information was transmitted by facsimile on April 4, 2001, to Mr. John Nagle of PSEG Nuclear LLC (the licensee). This information was transmitted to facilitate a upcoming conference call in order to determine an appropriate response time for the attached set of questions associated with the licensee's submittal dated December 1, 2000. In the submittal, the licensee requested a revision to the Hope Creek Generating Station (HCGS) Facility Operating License and Technical Specifications to increase the HCGS licensed power level by approximately 1.4%. This memorandum and the attachment do not convey or represent an NRC staff position regarding the HCGS power uprate request.

Docket No. 50-354

Attachment: Issues for Discussion in Upcoming Telephone Conference

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Issues for Discussion in Upcoming Telephone Conference  
Related to PSEG License Change Request H00-05, dated December 1, 2000  
Hope Creek Generating Station  
1.4% Power Uprate

Nuclear power plants are licensed to operate at a specified power, which, at operating power levels, is indicated in the control room by neutron flux instrumentation that has been calibrated to correspond to core thermal power. Core thermal power is determined by a calculation of the energy balance of the plant nuclear steam supply system. The accuracy of this calculation depends primarily upon the accuracy of feedwater flow, temperature, and pressure measurements, which are not safety grade and are not included in the plant technical specifications.

The uncertainty of calculating values of core thermal power determines the probability of exceeding the power levels assumed in the design basis transient and accident analyses. In this regard, to allow for uncertainties in determining thermal power (e.g., instrument measurement uncertainties), Appendix K to 10 CFR Part 50, requires loss of coolant accident (LOCA) and emergency core cooling system (ECCS) analyses to assume that the reactor had operated continuously at a power level at least 102% of the licensed thermal power. The 2% power margin uncertainty value was intended to address uncertainties related to heat sources in addition to instrument measurement uncertainties. Later, the NRC concluded that, at the time of the original ECCS rulemaking, the 2% power margin requirement appeared to be based solely on considerations associated with power measurement uncertainty.

Appendix K to 10 CFR Part 50 did not require demonstration of the power measurement uncertainty and mandated a 2% margin, notwithstanding that the instruments used to calibrate the neutron flux instrumentation may be more accurate than originally assumed in the ECCS rulemaking. In the June 1, 2000, *Federal Register*, (Volume 65, Number 106, Rules and Regulations, pages 34913-34921), the Commission published a final rule to reduce an unnecessarily burdensome regulatory requirement by allowing licensees to justify a smaller margin for power measurement uncertainty by using more accurate instrumentation to calculate the reactor thermal power and thereby calibrate the neutron flux instrumentation.

The purpose of the proposed changes is to obtain a power uprate on the basis of plant modifications that would result in improved accuracy of feedwater flow rate measurement, which is used in the calculation of reactor thermal power. The improved instrumentation (Crossflow ultrasonic flow measurement system) would allow the licensee to operate HCGS with a reduced margin between the actual power level and the 102% margin used in the licensing basis ECCS analyses.

To complete its review of the proposed license changes, the staff requests a description of the programs and procedures that will control calibration of the non-safety grade instrumentation that affect the total power uncertainty described in the licensee's proposed power uprate license amendment. The licensee has provided this information for the Crossflow system. For the remaining instrumentation the description should include a discussion of the procedures for:

1. Maintaining calibration,
2. Controlling software and hardware configuration,
3. Performing corrective actions,
4. Reporting deficiencies to the manufacturer, and
5. Receiving and addressing manufacturer deficiency reports.

The regulatory basis for this question is to verify that programs and procedures are in place to demonstrate that the actual power measurement uncertainty will not exceed the 0.6% uncertainty assumed in the licensee's analyses. This will provide assurance that the 1.4% power uprate is justified given the 2% margin required by Appendix K to 10 CFR Part 50.