August 19, 2003

Mr. Roy A. Anderson
President & Chief Nuclear Officer
PSEG Nuclear, LLC - X04
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2, REQUEST FOR ADDITIONAL INFORMATION (RAI) RE: REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS ON FUEL STORAGE POOL BORON CONCENTRATION, REFUELING POOL BORON CONCENTRATION AND FUEL ASSEMBLY STORAGE (TAC NOS. MB6345 AND MB6346)

Dear Mr. Anderson:

By letter dated September 20, 2002, PSEG Nuclear, LLC (PSEG) submitted a request for changes to the Salem Nuclear Generating Station, Unit Nos. 1 and 2, Technical Specifications (TSs). The proposed changes would revise TS 3/4.9.1, "Refueling Operations - Boron Concentration," and add new TS limiting conditions for operation 3/4.7.11, "Fuel Storage Pool Boron Concentration," and 3/4.7.12, "Fuel Assembly Storage in the Spent Fuel Pool." By letter dated February 14, 2003, PSEG submitted a new revision, thus superceding its original request dated September 20, 2002.

The U.S. Nuclear Regulatory Commission staff is reviewing your request, and has determined that additional information is necessary in order to complete its evaluation. We discussed the enclosed RAI, via telephone, with your staff on August 8, 2003. During this call, PSEG agreed to respond to the enclosed RAI within 45 days from the date of this letter. If circumstances result in the need to revise the target date, please contact me at (301) 415-1324.

Sincerely,

***/RA/***

Robert J. Fretz, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosure: As stated

cc w/encl: See next page

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Salem Nuclear Generating Station,
Unit Nos. 1 and 2

cc:

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REQUEST FOR ADDITIONAL INFORMATION

REQUEST FOR CHANGES TO TECHNICAL SPECIFICATIONS ON FUEL STORAGE POOL BORON CONCENTRATION, REFUELING POOL BORON CONCENTRATION AND FUEL ASSEMBLY STORAGE

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

By letter dated September 20, 2002, as supplemented on February 14, 2003, PSEG Nuclear, LLC submitted a request for changes to the Salem Nuclear Generating Station, Unit Nos. 1 and 2, Technical Specifications (TSs). The proposed changes would revise TS 3/4.9.1, "Refueling Operations - Boron Concentration," and add new TS limiting conditions for operation (LCOs) 3/4.7.11, "Fuel Storage Pool Boron Concentration," and 3/4.7.12, "Fuel Assembly Storage in the Spent Fuel Pool." The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing your request and has determined that additional information is necessary in order to complete its evaluation.

1. In your revised application, dated February 14, 2003, the proposed TSs and Bases for TS 3/4.9.1 adopt essentially word-for-word the TSs and Bases from NUREG-1431, Improved Standard Technical Specifications, Westinghouse Plants," including the following statement: "During refueling, the water volume in the spent fuel pool, the transfer canal, the refueling canal, the refueling cavity, and the reactor vessel form a single mass. As a result, the soluble boron concentration is relatively the same in each of these volumes." The proposed soluble boron concentration in TS LCO 3.7.11 for the spent fuel pool (SFP) is 800 ppm, and the refueling operations boron concentration that will be provided in the core operating limit report will always be > 2000 ppm. Therefore, a SFP soluble boron concentration of 800 ppm may be unacceptable, due to the potential to introduce positive reactivity in the reactor cavity during refueling operations because the concentration gradient between the reactor cavity (> 2000 ppm) and the SFP (> 800 ppm) via the refueling canal may cause a dilution event in the reactor cavity during refueling operations.

   Therefore, since NUREG-1431 generally assumes a soluble boron concentration on the order of ~2300 ppm, please: (a) explain how Salem interprets "relatively the same in each of these volumes," and describe what steps are taken to ensure that a dilution event in the reactor cavity does not occur, or (b) provide the analyses to demonstrate that there will not be a dilution gradient, and/or revise your soluble boron concentration for TS 3/4.7.11, if appropriate.

2. In Section 4.0 of LR-N03-0022, you stated that the determination of 600 ppm has included the necessary tolerances and uncertainties associated with fuel storage rack criticality analyses. Because it is unclear how the tolerances and uncertainties were included, and how the final $k_{eff}$ was calculated, please provide a detailed description of how bias, tolerances and uncertainties were calculated, and how the 95/95 probability/confidence level was determined in arriving at the final $k_{eff}$ for both the unborated and borated cases. Respond with the equations used and a summary of the

Enclosure

input values. Describe how this final $k_{eff}$ was used to calculate a required boron concentration. See NRC Memorandum from L. Kopp to T. Collins, "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light-Water Reactor Power Plants," dated August 19, 1998.

3. In the May 4, 1994 staff Safety Evaluation to your April 28, 1993, license amendment request, in which the SFP soluble boron concentration was determined, the staff stated that the reactivity equivalencing method used was acceptable. However, NUREG/CR-6683 entitled, "A Critical Review of the Practice of Equating the Reactivity of Spent Fuel to Fresh Fuel in Burnup Credit Criticality Safety Analyses for PWR Spent Fuel Pool Storage," published September 2000, demonstrates that reactivity equivalencing results in significant under-estimation of $k_{\infty}$ in soluble boron calculations when the presence of boron is not accounted for. Please describe the reactivity equivalencing method performed in your analysis, and clarify how the NUREG report applies to your application of reactivity equivalencing.