PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

SEP 2 4 2001
LRN - 01-0192
LCR S01-06

PSEG Nuclear LLC

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

Gentlemen:

REQUEST FOR CHANGE TO
TECHNICAL SPECIFICATION 3.9.1
BORON CONCENTRATION
SALEM GENERATING STATION
UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

In accordance with the requirements of 10CFR50.90, PSEG Nuclear LLC (PSEG) hereby transmits a request for revision of the Technical Specifications (TS) for Salem Generating Station Unit Nos. 1 and 2 respectively. Pursuant to the requirements of 10CFR50.91(b)(1), a copy of this request for amendment has been sent to the State of New Jersey.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and it has been determined that this request involves no significant hazards considerations.

PSEG has reviewed the proposed License Amendment Request (LCR) against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, PSEG concludes that the proposed change meets the criteria delineated in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

A description of the requested amendment, the reason for the changes, the justification for the changes, and the basis for no significant hazards consideration determination is provided in Attachment 1. The marked up Technical Specification pages, including Basis pages are provided in Attachment 2. Attachment 3 contains the insert for the Technical Specification Basis.

A001

PSEG requests that the amendment be made effective upon approval on April 30, 2002, but allow an implementation period of sixty (60) days to provide sufficient time for associated administrative activities.

Should you have any questions regarding this request, please contact E. Villar at (856) 339-5456.

Sincerely,

D. F. Garchow
Vice President - Operations

Affidavit
Attachments (3)

C Mr. H. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. R. Fretz, Licensing Project Manager - Salem
U. S. Nuclear Regulatory Commission
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Rockville, MD 20852

USNRC Resident Inspector Office (X24)

Mr. K. Tosch, Manager IV
Bureau of Nuclear Engineering
P. O. Box 415
Trenton, NJ 08625

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

D. F. Garchow, being duly sworn according to law deposes and says:

I am Vice President - Operations of PSEG Nuclear LLC, and as such, I find the matters set forth in the above referenced letter, concerning Salem Generating Station, Units 1 and 2, are true to the best of my knowledge, information and belief.

D. F. Garchow

Subscribed and Sworn to before me

this 24 day of September 2001

Sheri L. Huston
Notary Public of New Jersey

My Commission expires on

SHERI L. HUSTON
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires 12/08/2003

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1.0 INTRODUCTION

This letter is a request to amend the Operating Licenses for Salem Units 1 and 2, docket numbers 50-272 and 50-311, respectively.

The proposed change revises Technical Specification 3/4.9 REFUELING OPERATIONS to be consistent with the Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2, issued April 30, 2001).

2.0 DESCRIPTION OF THE PROPOSED CHANGE

The proposed revision:

1. Revises the limiting condition for operations (LCO) to be consistent with the wording of NUREG 1431 Rev 2,

2. Revises the APPLICABILITY of the LCO by adding a clarifying note to be consistent with NUREG 1431 Rev 2,

3. Revises the ACTION of the LCO to be consistent with the wording of the proposed LCO change,

4. Revises the current surveillance requirements by:
   a. eliminating surveillance 4.9.1.1, and
   b. revising 4.9.1.2 to be consistent with the new proposed LCO, and

5. Revises the Salem Technical Specification Basis, as described in attachment 3, to provide additional information relative to the required boron concentration.

Specifically, LCO 3.9.1 is revised as indicated below with the added text in bold and the deleted text strikethrough.

> 3.9.1 ~~With the reactor vessel head closure bolts less than fully tensioned or with the head unbolted or removed,~~ The boron concentration ~~of all filled portions~~ of the Reactor Coolant System, ~~and~~ the refueling canal**, and the refueling cavity** shall be maintained **within the limit specified in the CORE OPERATING LIMITS REPORT (COLR).** ~~uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:~~
>
> ~~a. Either a K_{eff} of 0.95 or less, which includes a 1% $\Delta k/k$ conservative allowance for uncertainties, or~~

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~~b. A boron concentration of ≥ 2000 ppm, which includes a 50 ppm conservative allowance for uncertainties.~~

APPLICABILITY: MODE 6* **(Only applicable to the refueling canal and refueling cavity when connected to the RCS)**

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate ~~and continue boration at ≥ 33 gpm of a solution containing ≥ 6,560 ppm boron or its equivalent until K_{eff} is reduced to ≤ 0.95 or the boron concentration is restored to ≥ 2000 ppm, whichever is the more restrictive.~~ **actions to restore boron concentration to within the limit specified in the COLR.** The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

~~4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:~~

~~a. Removing or unbolting the reactor vessel head, and~~

~~b. Withdrawal of any full length control rod in excess of 3 feet from its fully inserted position.~~

4.9.1.~~2~~ **1** Verify ~~t~~The boron concentration ~~of the reactor coolant system and the refueling canal shall be by chemical analysis at least 3 times per 7 days with a maximum time interval between samples of 72~~ **is within the limit of the COLR every 72 hours.**

In summary, the proposed change as described above provides the flexibility of controlling the required refueling boron concentration in the COLR report, while protecting the health and safety of the public and station personnel.

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3.0 BACKGROUND

The limitations on minimum boron concentration ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel.

The purpose of the proposed change is to provide consistency between the Salem Technical Specifications and NUREG 1431, thus avoiding the potential for misinterpretation of the Technical Specifications, while maintaining the same level of conservatism.

As core designs have evolved to incorporate greater cycle lengths and energy requirements, facilities like Salem that include the minimum required refueling boron concentration in their Technical Specifications have been approaching this Technical Specification limit. Therefore, it is reasonable to assume that with continued performance improvements the potential exists that the refueling boron concentration requirements in Technical Specifications 3/4.9 no longer being adequate (the most restrictive) for subsequent cycles.

The TS Basis is revised as stated in INSERT A of Attachment 3.

4.0 REGULATORY REQUIREMENT AND GUIDANCE

The proposed change revises Technical Specification 3/4.9 REFUELING OPERATIONS to be consistent with the guidance provided in the Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2, issued April 30, 2001).

5.0 TECHNICAL ANALYSIS

Design Basis

As specified in Technical Specification 3/4.9, the minimum refueling boron concentration is established at 2000 ppm with an allowance for 50 ppm uncertainty. For each reload core, boron concentration calculations are performed at two conditions to verify that the 2000 ppm requirement remains conservative or to establish a higher refueling boron concentration requirement: The two calculational cases are:

Case #1: Boron concentration (C_B) at K-effective (K_{eff}) = 0.95, All Rods In (ARI), Cold Zero Power (CZP), with 1% $\Delta K/K$ uncertainty added

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Case #2: C_B at K_{eff} = 0.99, All Rods Out (ARO), CZP with 1% $\Delta K/K$ uncertainty added

It should be noted that case #1 is included in Technical Specification 3/4.9 to be verified on a reload basis. Case #2, while not included in Technical Specification 3/4.9, is performed to be consistent with the assumptions documented in Chapters 4 and 9 of the Salem Updated Final Safety Analysis Report (UFSAR).

Historically, these two calculational cases resulted in boron concentrations, which were significantly less limiting than the minimum Technical Specification 3/4.9 boron concentration requirement. However, as core designs have evolved to incorporate greater cycle lengths and energy requirements, significantly more cycle energy is typically loaded into current industry standard 18-month high capacity factor reload cores. This has resulted in the minimum refueling boron concentration of 2000 ppm no longer being as conservative as it once was. It is reasonable to assume that with continued performance improvements in subsequent cycles, there is a potential for the 2000 ppm refueling boron concentration requirement of Technical Specifications 3/4.9 to no longer be the most limiting.

To avoid this condition, PSEG proposes to adopt the NUREG 1431 Technical Specifications requirements and incorporate the refueling boron concentration limit into the Core Operating Limit Report (COLR). PSEG will continue to perform the same two boron concentration cases listed above on a reload basis. The minimum refueling boron concentration will be established as the greater of the Case #1 result or the Case #2 result, but not lower than 2000 ppm.

The COLR is performed as part of each core reload safety evaluation to ensure that the limits of safety analysis are met. The analytical methods utilized to calculate the core operating limits are those reviewed and approved by the NRC and specified in the Salem Technical Specifications Section 6.9. Additionally, the COLR is submitted to the NRC in accordance with the requirements of the Salem Technical Specifications Section 6.9.

Risk Information

The proposed change does not include risk informed information in accordance with Regulatory Guide series 1.174 – 1.178.

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6.0 REGULATORY ANALYSIS

The justification of the proposed amendment as described in section 5.0 will bring consistency between the Salem Technical Specifications and the Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2, issued April 30, 2001).

7.0 DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION - 10CFR50.92 EVALUATION

PSEG Nuclear LLC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment,: as discussed below.

1. *Will not involve a significant increase in the probability or consequences of an accident previously evaluated.*

Response: No

The proposed Technical Specification change revises the Salem Technical Specification 3/4.9 REFUELING OPERATIONS to be consistent with the Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2). Relocating the required boron concentration from the Technical Specification to the Core Operating Limits Report (COLR) is not an accident initiator. Relocation of the required minimum boron concentration to the COLR will ensure that the proper boron concentration will be maintained in accordance with all the assumptions of the appropriate accident analysis.

The proposed change to revise the surveillance testing brings consistency between the new limiting condition for operations wording and the testing requirement. Therefore, the proposed change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does not create the possibility of a new or different kind of accident from any accident previously analyzed.*

Response: No

The proposed Technical Specification change revises the Salem Technical Specification 3/4.9 REFUELING OPERATIONS to be consistent with the Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2).

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The proposed revision does not change the physical facility or the manner that the plant is operated or tested. The manner and frequency at which the surveillance test is conducted remains unchanged. The proposed change to revise the surveillance testing brings consistency between the new limiting condition for operations wording and the testing requirement.

Therefore, the new proposed change to relocate the required boron concentration to the COLR does not create the possibility of a new or different kind of accident from any accident previously analyzed.

3. ***Does not involve a significant reduction in a margin of safety.***

Response: No

The proposed Technical Specification change revises the Salem Technical Specification 3/4.9 REFUELING OPERATIONS to be consistent with the Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2).

The COLR is performed as part of each core reload safety evaluation to ensure that the limits of safety analysis are met. The analytical methods utilized to calculate the core operating limits are those reviewed and approved by the NRC and specified in the Salem Technical Specifications Section 6.9. Additionally, the COLR is submitted to the NRC in accordance with the requirements of the Salem Technical Specifications Section 6.9.

Therefore, the new proposed change to relocate the required boron concentration to the COLR does not involve a significant reduction in a margin of safety.

Based on the above, PSEG concludes that the proposed amendment presents no significant hazard consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

8.0 ENVIRONMENTAL CONSIDERATIONS

PSEG has reviewed the proposed License Amendment Request (LCR) against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, nor increase the types and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, PSEG concludes that the proposed change meets the criteria

delineated in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

9.0 PRECEDENT

PSEG is not aware of a similar request submitted by another facility.

10.0 REFERENCES

1. Standard Technical Specifications Westinghouse Plants (NUREG-1431 Rev.2, issued April 30, 2001).

2. Updated Final Safety Analysis Report (UFSAR) Chapter 4.0.

3. Updated Final Safety Analysis Report (UFSAR) Chapter 9.0.

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TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating License DPR-70 are affected by this change request:

Technical Specification	Page
3.9.1	3/4 9 - 1
3/4 9 - 1	B 3/4 9 - 1

The following Technical Specifications for Facility Operating License DPR-75 are affected by this change request:

Technical Specification	Page
3.9.1	3/4 9 - 1
3/4 9 - 1	B 3/4 9 - 1

3/4.9 REFUELING OPERATIONS

BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 ~~With the reactor vessel head unbolted or removed,~~ **The** boron concentration ~~of all filled portions~~ of the Reactor Coolant System, ~~and~~ the refueling canal, **and the refueling cavity** shall be maintained **within the limit specified in the CORE OPERATING LIMITS REPORT (CORL).** ~~uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:~~

~~a. Either a K_{eff} of 0.95 or less, which includes a 1% $\Delta k/k$ conservative allowance for uncertainties, or~~

~~b. A boron concentration of $\geq$ 2000 ppm, which includes a 50 ppm conservative allowance for uncertainties.~~

APPLICABILITY: MODE 6*(**Only applicable to the refueling canal and refueling cavity when connected to the RCS**)

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate ~~and continue boration at $\geq$ 33 gpm of a solution containing $\geq$ 6,560 ppm boron or its equivalent until K_{eff} is reduced to $\leq$ 0.95 or the boron concentration is restored to $\geq$ 2000 ppm, whichever is the more restrictive.~~ **actions to restore boron concentration to within the limit specified in the COLR.** The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

~~4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:~~

~~a. Removing or unbolting the reactor vessel head, and~~

~~b. Withdrawal of any full length control rod in excess of 3 feet from its fully inserted position.~~

4.9.1.~~2~~ **1 Verify t**~~T~~he boron concentration ~~of the reactor coolant system and the refueling canal shall be determined by chemical analysis at least 3 times per 7 days with a maximum time interval between samples of 72 hours~~ is **within the limit of the COLR every 72 hours.**

* The reactor shall be maintained in MODE 6 whenever fuel is in the reactor with the reactor vessel head closure bolts less than fully tensioned or with the head removed.

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 ~~With the reactor vessel head closure bolts less than fully tension or with the head unbolted or removed,~~ The boron concentration ~~of all filled portions~~ of the Reactor Coolant System, ~~and~~ the refueling canal, **and the refueling cavity** shall be maintained **within the limit specified in the CORE OPERATING LIMITS REPORT (CORL).** ~~uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:~~

~~a. Either a K_{eff} of 0.95 or less, which includes a 1% $\Delta k/k$ conservative allowance for uncertainties, or~~

~~b. A boron concentration of $\geq$ 2000 ppm, which includes a 50 ppm conservative allowance for uncertainties.~~

APPLICABILITY: MODE 6*(**Only applicable to the refueling canal and refueling cavity when connected to the RCS**)

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate ~~and continue boration at $\geq$ 33 gpm of a solution containing $\geq$ 6,560 ppm boron or its equivalent until K_{eff} is reduced to $\leq$ 0.95 or the boron concentration is restored to $\geq$ 2000 ppm, whichever is the more restrictive.~~ **actions to restore boron concentration to within the limit specified in the COLR.** The provisions of Specification 3.0.3 are not applicable.

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* The reactor shall be maintained in MODE 6 whenever fuel is in the reactor with the reactor vessel head closure bolts less than fully tensioned or with the head removed.

3/4.9.1 BORON CONCENTRATION

~~The limitations on minimum boron concentration (2000 ppm) ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. The limitation on Keff of no greater than 0.95 which includes a conservative allowance for uncertainties, is sufficient to prevent reactor criticality during refueling operations.~~

INSERT A →

The sampling and analysis required by surveillance requirement 4.9.1.~~2~~ 1 ensures the boron concentration required by Limiting Condition of Operation 3.9.1 is met. Sampling and analysis of the refueling canal is required if water exists in the refueling canal, regardless of the amount.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel assemblies in the reactor pressure vessel ensures that sufficient time has elapsed to allow the radioactive decay of the short lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

3/4.9.4 CONTAINMENT BUILDING PENETRATIONS

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment the requirements for containment building penetration closure and OPERABILITY ensure that a release of fission product radioactivity within containment will be restricted from leaking to the environment. In MODE 6, the potential for containment pressurization as a result of an accident is not likely. Therefore, the requirements to isolate the containment from the outside atmosphere can be less stringent. The LCO requirements during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment are referred to as "containment closure" rather than containment OPERABILITY. For the containment to be OPERABLE, CONTAINMENT INTEGRITY must be maintained. Containment closure means that all potential release paths are closed or capable of being closed. Closure restrictions must be sufficient to provide an atmospheric ventilation barrier to restrict radioactive material released from a fuel element rupture during refueling operations.

The containment serves to limit the fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10CFR100. Additionally, the containment provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

3/4.9 REFUELING OPERATIONS
BASES

3/4.9.1 BORON CONCENTRATION

~~The limitations on minimum boron concentration (2000 ppm) ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) a uniform boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. The limitation on Keff of no greater than 0.95 which includes a conservative allowance for uncertainties, is sufficient to prevent reactor criticality during refueling operations.~~

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The containment serves to limit the fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10CFR100. Additionally, the containment provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

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INSERT A

Limiting the boron concentration of the Reactor Coolant System (RCS), refueling cavity, and refueling canal during refueling ensures that the reactor will remain sub-critical during Mode 6. Refueling boron concentration is the soluble boron concentration in the reactor coolant during refueling or fuel handling. The soluble boron concentration will offset the fuel reactivity and is measured by chemical analysis of the reactor coolant. The required boron concentration is based on the nuclear design of each fuel cycle as specified in the Core Operating Limits Report (COLR). The boron concentration specified in the COLR is conservative for Mode 6 and ensures that the initial conditions assumed for the boron dilution accident during refueling remain bounding. Plant procedures that control refueling operations along with maintaining the minimum boron concentration value specified in the COLR ensure that the keff of the core will be less than or equal to 0.95 during refueling operations, which includes a conservative allowance for uncertainties.