Public Service
Electric and Gas
Company

Joseph J. Hagan

Vice President - Nuclear Operations

Public Service Electric and Gas Company P.O. Box 236, Hancocks Bridge, NJ 08038 609-339-1200

MAR 04 1994

NLR-N94019
LCR 94-07

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

Gentlemen:

REQUEST FOR AMENDMENT
VANTAGE+ FUEL
SALEM GENERATING STATION UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSES DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311

In accordance with the requirements of 10CFR50.90, Public Service Electric and Gas Company (PSE&G) hereby transmits a request for amendment of Facility Operating Licenses DPR-70 and DPR-75 for Salem Unit Nos. 1 and 2. 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 would modify Sections 5.3 and 5.6 of the Salem Generating Station (SGS) Technical Specifications to allow the use of Westinghouse Vantage+ fuel with ZIRLO cladding. The proposed changes to Section 5.3, Reactor Core, are consistent with the guidance of Generic Letter 90-02, Supplement 1, and the improved Standard Technical Specifications of NUREG-1431, and are similar to Amendment No. 81 to the Millstone Unit 3 Technical Specifications, which was approved on July 26, 1993.

The proposed changes would allow PSE&G to proceed with implementation of the SGS Fuel Upgrade/Margin Recovery Program (FUMRP). The FUMRP objectives include reduced reactor coolant system activity, increased fuel reliability, reduced fuel cost, longer operating cycles, reduced spent fuel storage and disposal, and increased reactor vessel service life from lower leakage core designs. Full implementation of FUMRP will require additional Technical Specification changes to be submitted under separate cover, and several core reloads to achieve a transition to a full core of ZIRLO clad fuel assemblies.

In response to the NRC's Cost Beneficial Licensing Action (CBLA) initiative, PSE&G met with the NRR staff on November 12, 1993, to discuss our CBLA Program. PSE&G considers this submittal, as part of FUMRP, to be a CBLA. We have estimated that FUMRP would

A001

MAR 04 1994

result in a minimum average fuel cost savings of $4m/yr at each Salem Unit. Savings over the life of the plants would be $88m for Unit 1 and $104m for Unit 2.

Attachment 1 includes the description and justification for the proposed changes, including PSE&G's Determination of No Significant Hazards Consideration. Attachment 2 contains the Technical Specification pages revised with pen and ink changes.

Approval of this proposed amendment is requested by July 1, 1994, prior to the first shipment of fuel for the Unit 2 eighth refueling outage, which is scheduled to begin in September, 1994. An amendment requiring implementation within 60 days of issuance is requested.

Sincerely,

J. J. Hagan
Vice President -
Nuclear Operations

Affidavit
Attachments (2)
C Mr. T. T. Martin, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. J. C. Stone, Licensing Project Manager - Salem
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Mr. C. Marschall (S09)
USNRC Senior Resident Inspector

Mr. K. Tosch, Manager, IV
NJ Department of Environmental Protection
Division of Environmental Quality
Bureau of Nuclear Engineering
CN 415
Trenton, NJ 08625

Ref: NLR-N94019

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

J. J. Hagan, being duly sworn according to law deposes and says:

I am Vice President - Nuclear Operations of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning the Salem Generating Station, Unit Nos. 1 and 2, are true to the best of my knowledge, information and belief.

Subscribed and Sworn to before me
this 4th day of March, 1994

Notary Public of New Jersey

KIMBERLY JO BROWN
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires April 21, 1998

My commission expires on

ATTACHMENT 1

I. **DESCRIPTION OF THE PROPOSED CHANGES**

Revise the Salem Gnerating Station (SGS) Unit 1 and 2 Technical Specifications (TS) as shown in Attachment 2:

1) Revise Section 5.3.1, Fuel Assemblies, deleting specific mention of Zircaloy-4 fuel clad, to read as shown in Attachment 2:

   The reactor shall contain at least 193 fuel assemblies. Each assembly shall consist of a matrix of zirconium alloy clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide as fuel material. Limited substitutions of zirconium alloy or stainless steel filler rods for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

2) Revise Section 5.6.1, Fuel Storage, Criticality to add Vantage+ to the types of fuel assemblies that may be stored in the new and spent fuel storage racks.

II. **REASON FOR THE PROPOSED CHANGES**

1) The proposed changes to the fuel assemblies design features description of Specification 5.3.1 would allow flexibility in the type of zirconium alloy fuel cladding and filler rods allowed for use at SGS. The immediate benefit of the proposed change would be to allow the use of Westinghouse Vantage+ fuel, which uses ZIRLO cladding. The present Technical Specification wording requires the fuel rod cladding to be Zircaloy-4, which is used in the Westinghouse Standard and Vantage 5H fuel designs.

   The proposed change would also allow use of a limited number of lead test assemblies in nonlimiting core locations. This change is a generically endorsed line item improvement that would enhance fuel design product development and improvement.

   The statement requiring fuel designs to use NRC approved codes and methods is being added to ensure that given the flexibility allowed by the proposed Technical Specifications, core designs will continue to meet fuel

safety design bases in a manner accepted by the NRC. The overall reason for the proposed changes is to reduce or eliminate future changes to the Fuel Assemblies Technical Specifications by increasing the flexibility of the Specifications while ensuring the use of NRC approved design methods.

2) The proposed change to Section 5.6.1 relative to the new and spent fuel storage racks would allow receipt and storage of Vantage+ fuel. The present Technical Specifications only allow Standard and Vantage 5H fuel to be stored at SGS. This proposed change does not impact any safety analyses because it does not affect the parameters relative to stored fuel criticality safety (e.g., allowable fuel enrichment, power peaking factors, burnup, K_{eff}).

This change is included as a contingency in the event that this amendment request is approved and implemented prior to approval and implementation of our request to revise Technical Specification 5.6.1 in support of an increase to fuel storage capacity (ref: LCR 93-02, PSE&G letter to NRC dated April 28, 1993). LCR 93-02 proposes to replace the current Specification 5.6.1 with details of the irradiated and unirradiated fuel assembly characteristics associated with the new fuel vault, the existing spent fuel pool high density racks, and the proposed maximum density spent fuel storage racks. LCR 93-02 would delete references to specific fuel types (i.e., Standard, Vantage 5H, and Vantage+). Therefore, if LCR 93-02 is approved prior to approval of this request, the changes proposed herein for Specification 5.6.1 should be voided in favor of the LCR 93-02 changes.

III. JUSTIFICATION FOR THE PROPOSED CHANGES

The proposed change would allow the use of ZIRLO clad Vantage+ fuel at SGS. ZIRLO is similar to the Zircaloy-4 cladding which is presently in use at SGS in the Standard and Vantage 5H fuel assemblies. However, ZIRLO has the advantage of superior resistance to radiation induced corrosion, without sacrificing other important properties such as strength and ductility. NRC has reviewed Westinghouse topical report WCAP-12610 on Vantage+ fuel (reference 1), and documented its acceptance via references 2 and 3. The methodology of WCAP-12610 will be used for SGS core designs using Vantage+ fuel upon approval of this request for amendment.

Use of ZIRLO clad fuel is further supported by recent changes to 10CFR50.44 and 10CFR50.46, relative to combustible gas control and Emergency Core Cooling System (ECCS) performance (ref: 57FR39355, August 31, 1992). The rule changes added ZIRLO as an acceptable zirconium based alloy in order to reduce the need for exemptions from 10CFR50, without reducing the level of safety in fuel design.

The proposed change to Specification 5.3.1 is consistent with the Technical Specifications endorsed by the NRC via Generic Letter 90-02, Supplement 1 and the improved Standard Technical Specifications of NUREG-1431.

The proposed change to add Vantage+ to Specification 5.6.1 for the new and spent fuel storage racks does not impact any parameters affecting fuel handling and storage safety analyses (e.g., fuel enrichment, burnup, power peaking, K_{eff}).

IV. DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed changes to Technical Specifications 5.3.1 and 5.6.1 for Salem Generating Station (SGS) Unit Nos. 1 and 2:

(1) do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The fuel cladding design criteria for SGS would remain the same for ZIRLO clad fuel as it is for Zircaloy-4 clad fuel. All fuel design and performance criteria will continue to be met using NRC-approved methods and no new single failure mechanisms will be introduced. The use of ZIRLO clad fuel does not introduce any changes to plant equipment or operation that would adversely affect accident initiators or precursors. The proposed changes would not result in any changes to compliance with licensing basis safety limits.

(2) do not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes would require that NRC approved methods be used in fuel assembly design. No new operating configurations potentially resulting in the occurrence of a previously unanalyzed event would be allowed by the proposed change.

(3) do not involve a significant reduction in a margin of safety.

The proposed change would continue to require that NRC approved methods are used to ensure compliance with the fuel design and safety limits which ensure that an acceptable margin of safety is maintained relative to fuel assembly design.

Therefore, PSE&G has concluded that the changes proposed herein do not involve a Significant Hazards Consideration.

V. REFERENCES

1) WCAP-12610, "VANTAGE+ Fuel Assembly Reference Report" and Appendices A through D, June 1990; Appendix E, August 1990; Appendices F and G, December 1990; Addenda 1 through 3, February 1991; Addendum 4, May 1991.

2) Letter from A. C. Thadani (NRC) to S. R. Tritch (Westinghouse), "Acceptance for Referencing of Topical Report WCAP-12610, 'VANTAGE+ Fuel Assembly Reference Core Report'," July 1, 1991.

3) Letter from A. C. Thadani (NRC) to S. R. Tritch (Westinghouse), "Acceptance for Referencing of Topical Report WCAP-12610, 'VANTAGE+ Fuel Assembly Reference Core Report', Appendices F and G," October 9, 1992.