

Public Service  
Electric and Gas  
Company

Joseph J. Hagan

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Vice President - Nuclear Operations

AUG 06 1993

NLR-N93072  
LCR 93-15

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

Gentlemen:

REQUEST FOR AMENDMENT  
EMERGENCY CORE COOLING SYSTEMS  
SALEM GENERATING STATION  
UNIT NOS. 1 AND 2  
FACILITY OPERATING LICENSES NOS. DPR-70 AND DPR-75  
DOCKET NOS. 50-272 AND 50-311

In accordance with the requirements of 10CFR50.90, Public Service Electric & Gas Company (PSE&G) hereby transmits a request for amendment of Facility Operating Licenses DPR-70 and DPR-75 for Salem Generating Station, Unit Nos 1 and 2, respectively. In accordance with 10CFR50.91 (b) (1) requirements, a copy of this request has been sent to the State of New Jersey.

The proposed amendment modifies the actions of Technical Specification 3/4.5.1 - Emergency Core Cooling Systems - Accumulators. The change provides for a separate action if the Accumulator cannot meet the requirements of the Limiting Condition for Operation due to boron concentration. The allowed outage time to restore boron concentration is changed from one hour to 72 hours.

The requested changes are consistent with NUREG-1431, Standard Technical Specifications - Westinghouse Plants. This change has been approved for at least one other nuclear generating station, South Texas Project.

Attachment 1 includes a description, justification, and significant hazards analysis for the proposed change. Attachment 2 contains the Technical Specification pages revised with pen and ink changes.

PSE&G is requesting a 60 day implementation period after amendment approval.

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Should there be any questions with regard to this submittal,  
please do not hesitate to contact us.

Sincerely,

A handwritten signature in black ink, appearing to be "J. Stone", written in a cursive style with a long horizontal stroke extending to the right.

C Mr. J. C. Stone  
Licensing Project Manager

Mr. T. Johnson  
Senior Resident Inspector

Mr. T. Martin, Administrator  
Region I

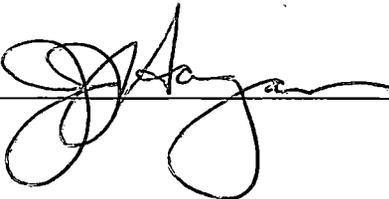
Mr. Kent Tosch, Manager, IV  
New Jersey Department of Environmental Protection  
Division of Environmental Quality  
Bureau of Nuclear Engineering  
CN 415  
Trenton, NJ 08625

REF: NLR-N93072

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.



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Subscribed and Sworn to before me  
this 6<sup>th</sup> day of August, 1993

  
Notary Public of New Jersey

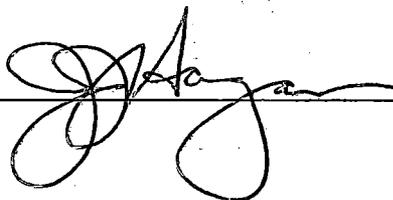
My Commission expires on \_\_\_\_\_  
**KIMBERLY JO BROWN**  
**NOTARY PUBLIC OF NEW JERSEY**  
My Commission Expires April 21, 1998

REF: NLR-N93072

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.



A handwritten signature in cursive script, appearing to read "J. J. Hagan", is written over a horizontal line.

Subscribed and Sworn to before me  
this 6th day of August, 1993.



A circular notary seal is partially visible on the left side of the page, containing the text "NOTARY PUBLIC STATE OF NEW JERSEY".

Kimberly Jo Brown  
Notary Public of New Jersey

My Commission expires on \_\_\_\_\_

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

EMERGENCY CORE COOLING SYSTEMSACCUMULATORSI. Description of Change

## A. Modify Technical Specification 3/4.5.1 Emergency Core Cooling Systems - Accumulators as follows:

## 1. Change Applicability to read:

MODES 1, 2, 3\*.

## 2. Change ACTION a to read:

With one accumulator inoperable, except as a result of a closed isolation valve or the boron concentration outside the required limits, restore the inoperable accumulator to OPERABLE status within one hour or be in HOT SHUTDOWN within the next 12 hours.

## 3. Add new ACTION c to read:

With the boron concentration of one accumulator outside the required limits, restore the boron concentration to within the required limits within 72 hours or be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to less than or equal to 1000 psig within the next 6 hours.

II. Background

The functions of the Emergency Core Cooling System accumulators are to supply water to the reactor vessel during the blowdown phase of a loss of coolant accident (LOCA), to provide inventory to help accomplish the refill phase that follows thereafter, and to provide Reactor Coolant System makeup for a small break LOCA.

The blowdown phase of a large break LOCA is the initial period of the transient during which the Reactor Coolant System departs from equilibrium conditions, and heat from fission product decay, hot internals, and the vessel continues to be transferred to the reactor coolant. The blowdown phase of a transient ends when the Reactor Coolant System pressure fails to a value approaching that of the containment atmosphere.

In the refill phase of a LOCA, which immediately follows the blowdown phase, reactor coolant inventory has vacated the core through steam flashing and ejection out through the break. The core is essentially in adiabatic heatup. The balance of accumulator inventory is then available to help fill voids in the lower plenum and reactor vessel downcomer so as to establish a recovery level at the bottom of the core and on-going reflood of the core with the addition of Safety Injection water.

The accumulators are pressure vessels partially filled with borated water and pressurized with nitrogen gas. The accumulators are passive components, since no operator or control actions are required in order for them to perform their function. Internal accumulator tank pressure is sufficient to discharge the accumulator contents to the Reactor Coolant System, if Reactor Coolant System pressure decreases below the accumulator pressure.

Each accumulator is piped into a Reactor Coolant System cold leg via an accumulator line and is isolated from the Reactor Coolant System by a motor operated isolation valve and two check valves in series. The accumulator size, water volume, and nitrogen cover pressure are selected so that three of the four accumulators are sufficient to partially cover the core before significant clad melting or zirconium water reaction can occur following a LOCA. The need to ensure that three accumulators are adequate for this function is consistent with the LOCA assumptions that the entire contents of one accumulator will be lost via the Reactor Coolant System pipe break during the blowdown phase of the LOCA.

With an accumulator inoperable for reasons other than a closed isolation valve, the current action is to restore operability within one hour or be in at least Hot Shutdown within the next 12 hours. If boron concentration is out of tolerance, it is not possible to change the boron concentration and confirm that the new concentration meets the technical specification limit within one hour.

### III. Justification for Change

The proposed change to the applicability is an administrative to provide clarity. The footnote and associated asterisk (\*) are associated with Mode 3 only. In Modes 1 and 2, it is not possible to operate at less than 1000 psig.

The proposed change modifies only the allowed outage time for one accumulator inoperable as a result of the boron concentration outside the required values. The increase in allowed outage time from one to 72 hours is consistent with NUREG-1431 Standard Technical Specifications - Westinghouse Plants. Also, this change has been approved for South Texas Project.

The accumulators are assumed operable in both large and small break LOCA analyses at full power. These are the design basis accidents that establish the acceptance limits for the accumulators. The minimum boron concentration setpoint is established to assure reactor subcriticality in a post LOCA environment. Of particular interest is the large break LOCA, since no credit is taken for control rod insertion. A reduction in the accumulator minimum boron concentration would produce a subsequent reduction in the available containment sump pH. The maximum boron concentration is used in determining the cold leg to hot leg recirculation injection switchover time and minimum sump pH.

During the initial injection phase of the calculated response to a LOCA, the boron content of the accumulators is not specifically evaluated since it is not of concern during this phase of the accident. During the recirculation phase, when the Emergency Core Cooling System is taking suction from the sump, the boron content of the accumulators is considered, as described above, but the contribution is small when its volume is compared with the total volume of the Reactor Coolant System and the Refueling Water Storage Tank. During a LOCA, the contents of one accumulator would be less than two percent of the total volume of water in the containment.

If the boron content of the accumulators is found to be in violation of the requirement, it is not possible to change the boron concentration and confirm that the new concentration meets the Technical Specification limits within one hour. The challenges and risks to plant systems which would be caused by a plant shutdown as a result of the current one hour allowed outage time in specification 3.5.1 are considered to be more significant than continued operation beyond one hour with boron concentration of one accumulator outside the technical specification limits.

Because the volume contribution of one accumulator is small and it is not possible to take corrective action within one hour, the NRC agreed to extend the allowed outage time for this condition from one hour to 72 hours in NUREG-1431 Standard Technical Specifications - Westinghouse Plants and in the South Texas Project Technical Specifications. This change is applicable to all Westinghouse plants since the cited reasons are generic.

#### IV. Significant Hazards Consideration

In accordance with 10CFR50.92, PSE&G has reviewed the proposed changes and concluded the proposed changes do not involve a significant hazards consideration because the changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously analyzed.

The proposed change to the Applicability is an administrative change for clarity. The proposed change to the allowed outage time for one accumulator inoperable as a result of the boron concentration outside the required values does not alter the plant configuration or operation. The boron concentration of the accumulators is considered only during the recirculation phase of the analyzed accidents. One accumulator outside the required concentration limits will have no effect on available Emergency Core Cooling System water and an insignificant effect on core subcriticality during core reflood, switchover from cold leg to hot leg recirculation injection, or sump pH. Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident.

The proposed change in allowed outage time does not require physical alteration to any plant system or change the method by which any safety-related system performs its function. It provides uniformity with the latest specifications per NUREG-1431, Standard Technical Specifications - Westinghouse Plants. Therefore, the proposed change will not increase the possibility of a new or different kind of accident from any accident previously identified.

3. Involve a significant reduction in a margin of safety.

The proposed change to the Applicability is an administrative change for clarity. The proposed change in allowed outage time for one accumulator inoperable as a result of the boron concentration outside of the required values does not alter the manner in which safety limits, limiting safety system setpoints, or limiting conditions for operation are determined. The boron concentration of the accumulators is considered only during the recirculation phase of the analyzed accidents and the contribution of one accumulator is small when its volume is compared with the total volume of the Reactor Coolant System and the Refueling water Storage Tank. One accumulator outside the allowed concentration limits will have no effect on available Emergency Core Cooling System water and an insignificant effect on core subcriticality during core reflood, switchover from cold leg to hot leg recirculation injection, or pH. Therefore, this change does not involve a significant reduction in any margin of safety.

#### V. Conclusions

Based on the information presented above, PSE&G has concluded there is no significant hazards consideration.