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Docket No. 50-272

Public Service Electric & Gas Company
 ATTN: Mr. F. P. Librizzi
 General Manager - Electric
 Production
 Production Department
 80 Park Place, Room 7221
 Newark, New Jersey 07101

Gentlemen:

The Commission has issued the enclosed Amendment No. 8 to Facility Operating License No. DPR-70 for the Salem Nuclear Generating Station, Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application dated July 20, 1977 (as supplemented by letter dated August 1, 1977) and confirms the Commission's action taken on July 21, 1977.

The amendment to the Technical Specifications revises the time limitation that the Boron Injection Tank (BIT) is permitted to be inoperable prior to implementing the requirement for placing the reactor in HOT STANDBY and to a SHUTDOWN MARGIN equivalent to 1% Δk/k.

Copies of the Safety Evaluation and the FEDERAL REGISTER Notice are also enclosed.

Sincerely,

Original signed by

George Lear, Chief
 Operating Reactors Branch #3
 Division of Operating Reactors

Enclosures:

1. Amendment No. 8
2. Safety Evaluation
3. FEDERAL REGISTER Notice

cc w/enclosures:
 See next page

OFFICE →	ORB #3 <i>CP</i>	ORB #3 <i>DM</i>	OELD <i>B. Smith</i>	ORB #3	RSB <i>CLB</i>
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DATE →	8/25/77	8/25/77	9/11/77	9/11/77	9/9/77



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

September 21, 1977

Docket No. 50-272

Public Service Electric & Gas Company
ATTN: Mr. F. P. Librizzi
General Manager - Electric
Production
Production Department
80 Park Place, Room 7221
Newark, New Jersey 07101

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Copies of the Safety Evaluation and the FEDERAL REGISTER Notice are also enclosed.

Sincerely,

A handwritten signature in cursive script that reads "George Lear".

George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Enclosures:

1. Amendment No. 8
2. Safety Evaluation
3. FEDERAL REGISTER Notice

cc w/enclosures:
See next page

cc:

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Newark, New Jersey 07101

Troy B. Conner, Jr., Esquire
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Gene Fisher
Bureau Chief
Bureau of Radiation Protection
380 Scotts Road
Trenton, New Jersey 08628

Honorable Samuel Donolson
Mayor, Lower Alloways Creek Township
Salem County, New Jersey 08079

State House Annex
ATTN: Deputy Attorney General
State of New Jersey
36 West State Street
Trenton, New Jersey 08625

Attorney General
Department of Law & Public Safety
State House Annex
Trenton, New Jersey 08625

Richard B. McGlynn, Commissioner
Department of Public Utilities,
State of New Jersey
101 Commerce Street
Newark, New Jersey 07102

Public Service Electric & Gas Company
ATTN: Herbert J. Heller
Manager, Salem Nuclear Generating
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Hancocks Bridge, New Jersey 08038

Chief, Energy Systems Analysis Br. (AW-459)
Office of Radiation Programs
U. S. Environmental Protection Agency
Room 645, East Tower
401 M Street, S. W.
Washington, D. C. 20460

U. S. Environmental Protection Agency
Region II Office
ATTN: EIS COORDINATOR
26 Federal Plaza
New York, New York 10007

Salem Free Library
112 West Broadway
Salem, New Jersey 08079

Public Service Electric & Gas Co.
ATTN: R. L. Mittl
General Manager - Licensing
and Environment
80 Park Place
Newark, New Jersey 07101



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
PHILADELPHIA ELECTRIC COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 8
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensee) dated July 20, 1977 (as supplemented by letter dated August 1, 1977), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

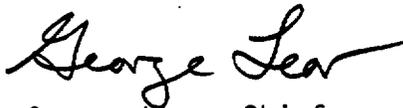
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-70 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 8, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment was effective as of July 20, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 21, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 7

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Replace the following page of the Appendix "A" Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains vertical lines indicating the area of change. The corresponding overleaf page 3/4 5-8 is also provided to maintain document completeness. No changes were made on 3/4 5-8.

Page

3/4 5-7

EMERGENCY CORE COOLING SYSTEMS

3/4.5.4 BORON INJECTION SYSTEM

BORON INJECTION TANK

LIMITING CONDITION FOR OPERATION

- 3.5.4.1 The boron injection tank shall be OPERABLE with:
- A minimum contained volume of 900 gallons of borated water,
 - Between 20,100 and 21,800 ppm of boron, and
 - A minimum solution temperature of 145°F.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With the boron injection tank inoperable, restore the tank to OPERABLE status within 1 hour or be in HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 6 hours; restore the tank to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 12 hours.*

SURVEILLANCE REQUIREMENTS

- 4.5.4.1 The boron injection tank shall be demonstrated OPERABLE by:
- Verifying the water level through a recirculation flow test at least once per 7 days,
 - Verifying the boron concentration of the water in the tank at least once per 7 days, and
 - Verifying the water temperature at least once per 24 hours.

*Effective 6:30 P.M. July 20, 1977 and expiring at 6:30 A.M., July 21, 1977 the following ACTION statement is applicable: With the boron injection tank inoperable, restore the tank to OPERABLE status within 1 hour or be in HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 18 hours; restore the tank to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 12 hours.

EMERGENCY CORE COOLING SYSTEMS

3/4.5.4 BORON INJECTION SYSTEM

BORON INJECTION TANK

LIMITING CONDITION FOR OPERATION

3.5.4.1 The boron injection tank shall be OPERABLE with:

- a. A minimum contained volume of 900 gallons of borated water,
- b. Between 20,100 and 21,800 ppm of boron, and
- c. A minimum solution temperature of 145°F.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With the boron injection tank inoperable, restore the tank to OPERABLE status within 1 hour or be in HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 6 hours; restore the tank to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 12 hours.*

SURVEILLANCE REQUIREMENTS

4.5.4.1 The boron injection tank shall be demonstrated OPERABLE by:

- a. Verifying the water level through a recirculation flow test at least once per 7 days,
- b. Verifying the boron concentration of the water in the tank at least once per 7 days, and
- c. Verifying the water temperature at least once per 24 hours.

*Effective 6:30 P.M. July 20, 1977 and expiring at 6:30 A.M., July 21, 1977 the following ACTION statement is applicable: With the boron injection tank inoperable, restore the tank to OPERABLE status within 1 hour or be in HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$ at 200°F within the next 18 hours; restore the tank to OPERABLE status within the next 7 days or be in HOT SHUTDOWN within the next 12 hours.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE DPR-70

PUBLIC SERVICE ELECTRIC AND GAS COMPANY,
PHILADELPHIA ELECTRIC COMPANY,
DELMARVA POWER AND LIGHT COMPANY, AND
ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-272

Introduction

By letter dated July 20, 1977, as supplemented by letter dated August 1, 1977, Public Service Electric and Gas Company (PSE&G) requested a temporary change to the Technical Specifications appended to Facility Operating License DPR-70 for the Salem Nuclear Generating Station Unit No. 1. The proposed change involved revision of the time limitation that the Boron Injection Tank (BIT) is permitted to be inoperable prior to implementing the requirement for placing the reactor in HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to 1% $\Delta K/K$. The staff authorized by telephone, an emergency Technical Specification change on July 20, 1977 which was confirmed in writing on July 21, 1977.

Background

On July 20, 1977, during the 12:00 a.m. to 8:00 a.m. shift, a boron analysis of the BIT showed the boron concentration to be higher than the Technical Specification limit of 21,800 ppm. The plant operators initiated dilution of the BIT and at 10:50 a.m. on July 20, 1977, the BIT was restored to operable status with its boron concentration within the 20,100 to 21,800 ppm limit. At 11:30 a.m., however, chemical analysis showed the BIT to be below its lower concentration limit. Addition of boric acid to the system was initiated. At 4:05 p.m. the boron concentration had increased at 19,300 ppm (approximately 4% below the limit). At that time, the licensee stated that an emergency power demand existed on the Pennsylvania-New Jersey-Maryland Interconnection. The Interconnection was operating at maximum emergency generation conditions and capacity was expected to remain short for the duration of the existing hot weather conditions. In view of the foregoing, PSE&G requested an urgent temporary change to extend the administrative limit of 6 hours during which the BIT is permitted to be inoperable, i.e., outside of its specified limits for boron concentration. Due to the power demands on the Interconnection, the staff concluded that an expedited review was appropriate. The staff prepared on July 20, 1977 a preliminary safety evaluation of the technical specification change and concluded that the change should be authorized. The purpose of this safety evaluation is to formally document the analysis made by the staff on July 20, 1977.

Evaluation

The BIT is provided as part of the Emergency Core Cooling System. The Technical Specification on the lower limit for boron concentration in the BIT water is required to ensure that sufficient negative reactivity is injected into the core to promptly counteract any positive increase in reactivity caused by inadvertent cooldown of the reactor coolant system. Such cooldown could be caused by inadvertent depressurization, a loss-of-coolant accident or a main steam line rupture.

The minimum capability for injection of high concentration boron (20,100 ppm) is based on the most restrictive core conditions: end-of-life shutdown margin, equilibrium xenon conditions, most reactive control rod assembly stuck in its fully withdrawn position, and the negative moderator coefficient corresponding to the end-of-life, rodded core.

On July 20, 1977 the reactor was operating at 70% power with the soluble boron concentration in the reactor coolant system at 891 ppm. For these conditions the licensee determined by calculations that the availability of the BIT was not necessary to satisfy the criteria for shutdown margin in the event of inadvertent cooldown. The positive reactivity change associated with inadvertent cooldown was 0.0254 $\Delta K/K$ (this change of reactivity is attributable to the potential for .0102 $\Delta K/K$ gain for power defect and .0152 for the isothermal temperature defect). This positive reactivity effect could have been compensated for by the worth of the control rods alone (.0454 $\Delta K/K$); hence, the criteria of 1% $\Delta K/K$ shutdown margin was satisfied by the control rods allowing for one stuck rod.

The NRC staff has reviewed the licensee's analysis and agrees with the conclusion. We have determined that the licensee's analysis is conservative in view of the facts that (1) no credit is taken for Xenon negative reactivity buildup after shutdown, (2) no credit was taken for the addition of any boron (negative reactivity) from the BIT, and (3) the conservative reactivity estimates were based on core cycle end-of-life conditions. We further determined that it would be at least 24 hours following reactor shutdown that boron would have to be added to the reactor coolant system in order to satisfy the 1% shutdown margin criteria. Another aspect of the BIT boron concentration limits relates to the coolant ability to scavenge iodine following a loss of coolant accident. If the concentration in the BIT exceeds the limit by greater than approximately 10%, the acidity of the BIT solution would tend to reduce the iodine removal effectiveness of the coolant. For the situation analyzed on July 20, 1977, the concentration did not exceed 4% of the limit. Accordingly, the temporary technical specification change would not effect the ability of the coolant to scavenge iodine.

In conclusion, the NRC staff found an extension of the time limitation (from 6 hours to 18 hours) that the BIT is permitted to be inoperable, i.e., outside limits for boron concentration, an acceptable temporary technical specification change at the current exposure history of 3000 MWD/MTU for the Salem Unit No. 1 facility.

Environmental Considerations

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §1.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: September 21, 1977

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-272

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

PHILADELPHIA ELECTRIC COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 8 to Facility Operating License No. DPR-70, issued to Public Service Electric and Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees), which revised the operating license for Salem Nuclear Generating Station, Unit No. 1 (the facility) located in Salem County, New Jersey. The amendment is effective as of July 20, 1977.

The amendment consists of changes to the Technical Specifications which will revise the time limitation that the Boron Injection Tank (BIT) is permitted to be inoperable prior to implementing the requirement for placing the reactor in HOT STANDBY and to a SHUTDOWN MARGIN equivalent to 1% $\Delta k/k$.

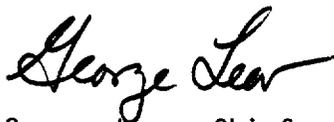
The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated July 20, 1977 (as supplemented by letter dated August 1, 1977), (2) the Commission's letter to the licensee dated July 21, 1977, (3) Amendment No. 8 to License No. DPR-70 and (4) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street N. W., Washington, D. C. and at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey. A copy of items (2), (3) and (4) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 21st day of September, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors