

NOVEMBER 20 1979

Docket No. 50-272

REGULATORY DOCKET FILE COPY

Mr. F. P. Librizzi, General Manager
Electric Production
Public Service Electric and Gas Company
80 Park Place, Room 7221
Newark, New Jersey 07101

Dear Mr. Librizzi:

The Commission has issued the enclosed Amendment No. *22* to Facility Operating License No. DPR-70 for the Salem Nuclear Generating Station, Unit No. 1. This amendment deletes Section 2.C(3) of Facility Operating License No. DPR-70.

The amendment lifts a restriction on secondary water level rise rate whenever the secondary water level in a steam generator is below the level of the feedwater sparger.

We have discussed with representatives of your staff criteria for a procedure that will better accomplish the objective of this license condition. We have been advised by the NRC Resident Inspector that a procedure has been developed for Salem Unit No. 1 that meets these criteria and that implementation of this procedure will be verified by the Office of Inspection and Enforcement.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Original Signed By

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:

- 1. Amendment No. *22* to DPR-70
- 2. Safety Evaluation
- 3. Notice of Issuance

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SURNAME	See next page				
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 20, 1979

Docket No. 50-272

Mr. F. P. Librizzi, General Manager
Electric Production
Public Service Electric and Gas Company
80 Park Place, Room 7221
Newark, New Jersey 07101

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Sincerely,

A handwritten signature in cursive script, appearing to read "A. Schwencer".

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:

1. Amendment No. 22 to DPR-70
2. Safety Evaluation
3. Notice of Issuance

cc: w/enclosures
See next page

Mr. F. P. Librizzi
Public Service Electric and Gas Company - 2 - November 20, 1979

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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. 22
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - B. 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;
 - C. 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
 - D. 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.

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2. Accordingly, the license is amended by deletion of Section 2.C(3).
3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Date of Issuance: November 20, 1979



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 22 TO FACILITY OPERATING LICENSE NO. 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

Facility Operating License No. DPR-70 for Salem Unit No. 1 contains a condition that limits the secondary side water level rise rate in each steam generator when the secondary side water level is below the level of the feedwater sparger. This condition was imposed as an interim measure to prevent water hammers until the licensee demonstrated that secondary side flow instability would not result in unacceptable consequences.

By letter dated August 23, 1979 (Reference 1) the licensee referred to the restriction in Section 2.C(3) of Facility Operating License No. DPR-70 as a possible unreviewed safety question and proposed that it should be lifted. This document presents the staff's evaluation of the license condition and concludes that this license condition should be lifted.

Discussion

Section 2.C(3) of Facility Operating License No. DPR-70 reads as follows:

Steam Generator Water Rise Rate

Except for the purpose of performing secondary side flow stability tests, Public Service Electric and Gas Company shall, whenever the secondary side water level in a steam generator is below the level of the feedwater sparger, limit the secondary water level rise rate in each steam generator to less than 1.2 inches per minute and shall reduce the rise rate to within this limit within two (2) minutes. This condition will be removed by amendment of this license when Public Service Electric and Gas Company demonstrates to the satisfaction of the Commission that secondary side flow instability (water hammer) does not result in unacceptable consequences.

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This condition was determined to afford adequate measures against water hammer while the staff and the licensee further assessed the significance of water hammer considerations at Salem Unit No. 1. The purpose of limiting the water level rise rate in the steam generator was to limit the flow of subcooled water in the feedwater piping and feeding when the subcooled water is in contact with steam in the feedwater piping and feeding.

The staff has completed a review of steam generator water hammer at Salem Unit No. 1 (Reference 2) and has determined that the provisions that have been made for minimizing the likelihood of water hammer events due to the rapid condensation of steam in the feedwater systems at Salem Unit No. 1 are acceptable.

The licensee has proposed to provide more effective procedural control of the feedwater flow in lieu of the license condition. Our evaluation addresses the need for such procedures under normal, transient, and emergency modes of operation.

Evaluation

Tests performed at Indian Point Unit No. 2 under conditions where subcooled water is in contact with steam in the feedwater piping and feeding showed that there were indications of water hammer at a flow of 240 gpm but there were no indications at 200 gpm and lower flows. The results of those tests are given in Reference 3. It was estimated that 200 gpm corresponded to a steam generator water level rise rate of approximately 1.2 inches per minute, including appropriate margins for error. It was further assumed that whenever the level of water in the steam generator dropped below the feeding, the ring would drain rapidly, and, in approximately two minutes, steam would enter the feeding and piping and come in contact with subcooled water. Based on the result of those tests, it was considered prudent to incorporate the flow limitations of Section 2.C(3) into the license for Salem Unit No. 1.

Some of the assumptions that formed the basis for the license condition apply only to a feeding that discharges from the bottom. The design of the Salem Unit No. 1 feedings was revised to include "J" tubes that discharge from the top of the ring. When a feeding discharges from the top, the water does not drain quickly. Under transient conditions, such

as a plant trip with loss of feedwater, the steam generator water level will drop below the feeding but the feeding will be kept filled by the auxiliary feedwater that is automatically actuated upon a low water level signal in the steam generator. Administrative restrictions on flow are not necessary under these conditions.

There may be situations, however, when operator inattention or failures in the auxiliary feedwater system lead to the introduction of subcooled water into the steam-filled feedwater ring and piping. Therefore, procedures for refilling a steam generator should include precautions to restrict feedwater flow to 200 gallons per minute when, coincidentally, all water flow to the feeding has been interrupted for five minutes or more and the water level in the steam generator is below the top of the feeding. Such a procedure does not require restrictions of flow nor intervention by the operator in the event of a plant trip or a loss of feedwater event. After a plant trip, the operator will usually throttle auxiliary feedwater flow to prevent overcooling of the reactor coolant system or overfilling of the steam generator. If for some reason, the operator is confronted with an overheating situation, maximum feedwater flow will take precedence over water hammer considerations.

We have evaluated the potential for steam generator water hammer at Salem Unit No. 1 and have concluded that modifications are not necessary to reduce further the likelihood of a damaging steam generator water hammer.

We agree that this license condition should be lifted because it is misleading and may cause actions to be taken that would unnecessarily restrict the flow of auxiliary feedwater. The objective of this license condition will better be accomplished by specific operating procedures. We have set forth herein the criteria for such procedures. The procedures will be established by the licensee and verified by an NRC inspector.

In establishing appropriate operating procedures, the licensee will:
(1) modify the procedures for auxiliary feedwater system operation to include precautions to limit auxiliary feedwater flow to 200 gallons per minute when coincidentally all water flow to the feeding has been interrupted for more than five minutes and the water level in the steam generator is below the top of the feeding, (2) issue a memorandum to licensed operators providing the background and the basis for these procedures, and (3) place a cautionary tag in the vicinity of the controls for the auxiliary feedwater system.

Environmental Consideration

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 §51.5(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 found that the license condition in Section 2.C(3) of Facility Operating License No. DPR-70 for Salem Unit No. 1 could mislead the licensee to restrict the flow of auxiliary feedwater unnecessarily. We have concluded that the intent of this condition will be accomplished more effectively by the procedures proposed by the licensee. Therefore, we have determined that Section 2.C(3) should be deleted from Facility Operating License No. DPR-70.

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.

Date: November 20, 1979

References

1. Letter, PSEG (Librizzi) to NRC (Grier), dated August 23, 1979.
Reportable Occurrence 79-52/OIT.
2. Letter, NRC (Schwencer) to PSEG (Librizzi) dated November 3, 1979.
3. NUREG-0291, "An Evaluation of PWR Steam Generator Water Hammer,"
June 1977.

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-272PUBLIC SERVICE ELECTRIC AND GAS COMPANY,
PHILADELPHIA ELECTRIC COMPANY,
DELMARVA POWER AND LIGHT COMPANY, AND
ATLANTIC CITY ELECTRIC COMPANYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 22 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 Facility Operating License No. DPR-70 for operation of the Salem Nuclear Generating Station, Unit No. 1 (the facility) located in Salem County, New Jersey. The amendment is effective as of the date of issuance.

The amendment deletes Section 2.C(3) thereby lifting a restriction on auxiliary feedwater level rise rate whenever the secondary water level in a steam generator is below the level of the feedwater sparger.

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.

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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) Amendment No. 22 to License No. DPR-70, and (2) 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) and (3) 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 20th day of November, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors