February 7, 199

Mr. Leon R. Eliason
Chief Nuclear Officer & President-
Nuclear Business Unit
Public Service Electric and Gas
Company
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT FOR AN EXEMPTION FROM 10 CFR 50.60, "ACCEPTANCE CRITERIA FOR FRACTURE PREVENTION MEASURES FOR LIGHT-WATER NUCLEAR POWER REACTORS FOR NORMAL OPERATION," SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M91166 AND M91167)

Dear Mr. Eliason:

Enclosed is the "Environmental Assessment and Finding of No Significant Impact" related to your request for an exemption from certain requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Light-Water Nuclear Power Reactors for Normal Operation," for the Salem Nuclear Generating Station, Units 1 and 2. The request was submitted by letter dated December 22, 1994, and requests an exemption from Appendices G and H to 10 CFR Part 50 so that the American Society of Mechanical Engineers Code Case N-514, "Low Temperature Overpressure Protection," may be used as an acceptable alternative method to determine the acceptable low temperature overpressure protection setpoints.

This assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

C. Poslusny for
John F. Stolz, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-272/311

Enclosure: Environmental Assessment

cc w/encl: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 7, 1995

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Public Service Electric and Gas
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Mr. Leon R. Eliason
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Units 1 and 2

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UNITED STATES NUCLEAR REGULATORY COMMISSION

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

DOCKET NOS. 50-272 AND 50-311

ENVIRONMENTAL ASSESSMENT AND

FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from certain requirements of its regulations to Facility Operating License Nos. DPR-70 and DPR-75, issued to the Public Service Electric and Gas Company, PECO Energy Company, Delmarva Power and Light Company, and Atlantic City Electric Company, licensees for the Salem Nuclear Generating Station, Units 1 and 2. The plants are located at the licensee's site in Salem County, New Jersey. The exemption was requested by the licensee by letter dated December 22, 1994.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action:

The proposed action requests an exemption from certain requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Light-Water Nuclear Power Reactors for Normal Operation," to allow application of an alternate methodology to determine the low temperature overpressure protection (LTOP) setpoint for the Salem Nuclear Generating Station, Units 1 and 2. The proposed alternate methodology is consistent with guidelines developed by the American Society of Mechanical Engineers (ASME) Working Group on Operating Plant Criteria (WGOPC) to define pressure limits during LTOP events that avoid certain unnecessary operational restrictions, provide adequate margins against failure of the reactor pressure vessel, and reduce the potential for unnecessary activation of pressure-relieving devices used

for LTOP. These guidelines have been incorporated into Code Case N-514, "Low Temperature Overpressure Protection," which has been approved by the ASME Code Committee. The content of this code case has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI.

The philosophy used to develop Code Case N-514 guidelines is to ensure that the LTOP limits are still below the pressure/temperature (P/T) limits for normal operation, but allow the pressure that may occur with activation of pressure-relieving devices to exceed the P/T limits, provided acceptable margins are maintained during these events. This philosophy protects the pressure vessel from LTOP events, and still maintains the Technical Specification P/T limits applicable for normal heatup and cooldown in accordance with Appendix G to 10 CFR Part 50 and Sections III and XI of the ASME Code.

The Need for the Proposed Action:

Pursuant to 10 CFR 50.60, all light-water nuclear power reactors must meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary as set forth in Appendices G and H to 10 CFR Part 50. Appendix G to 10 CFR Part 50 defines P/T limits during any condition of normal operation, including anticipated operational occurrences and system hydrostatic tests, to which the pressure boundary may be subjected over its service lifetime. It is specified in 10 CFR 50.60(b) that alternatives to the described requirements in Appendices G and H to 10 CFR Part 50 may be used when an exemption is granted by the Commission under 10 CFR 50.12.

To prevent transients that would produce pressure excursions exceeding the Appendix G P/T limits while the reactor is operating at low temperatures, the licensee installed an LTOP system. The LTOP system includes pressure relieving devices in the form of Power-Operated Relief Valves (PORVs) that are set at a pressure low enough that if a transient occurred while the coolant temperature is below the LTOP enabling temperature, they would prevent the pressure in the reactor vessel from exceeding the Appendix G P/T limits. To prevent these valves from lifting as a result of normal operating pressure surges (e.g., reactor coolant pump starting, and shifting operating charging pumps) with the reactor coolant system in a water solid condition, the operating pressure must be maintained below the PORV setpoint.

In addition, in order to prevent cavitation of a reactor coolant pump, the operator must maintain a differential pressure across the reactor coolant pump seals. Hence, the licensee must operate the plant in a pressure window that is defined as the difference between the minimum required pressure to start a reactor coolant pump and the operating margin to prevent lifting of the PORVs due to normal operating pressure surges. The licensee's current LTOP analysis, which removes the non-conservatism in a previous analysis by assuming one reactor coolant pump in operation, indicates that using the Appendix G safety margin to determine the PORV setpoint would result in a new pressure setpoint within the current operating window of Salem 1 and a new setpoint just outside the current operating window of Salem 2. In both cases, there would be no margin for normal operating pressure surges. Operating with these limits could result in the lifting of the PORVs and cavitation of the reactor coolant pumps during normal operation. Therefore, the licensee

proposed that in determining the PORV setpoint for LTOP events for Salem, the allowable pressure be determined using the safety margins developed in an alternate methodology in lieu of the safety margins required by Appendix G to 10 CFR Part 50. The alternate methodology is consistent with ASME Code Case N-514. The content of this code case has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI.

An exemption from 10 CFR 50.60 is required to use the alternate methodology for calculating the maximum allowable pressure for LTOP considerations. By application dated December 22, 1994, the licensee requested an exemption from 10 CFR 50.60.

Environmental Impacts of the Proposed Action:

The Commission has completed its evaluation of the proposed action.

Appendix G of the ASME Code requires that the P/T limits be calculated: (a) using a safety factor of 2 on the principal membrane (pressure) stresses, (b) assuming a flaw at the surface with a depth of one-quarter (1/4) of the vessel wall thickness and a length of six (6) times its depth, and (c) using a conservative fracture toughness curve that is based on the lower bound of static, dynamic, and crack arrest fracture toughness tests on material similar to the Salem reactor vessel material.

In determining the PORV setpoint for LTOP events, the licensee proposed to use safety margins based on an alternate methodology consistent with the proposed ASME Code Case N-514 guidelines. The ASME Code Case N-514 allows determination of the setpoint for LTOP events such that the maximum pressure in the vessel would not exceed 110% of the P/T limits of the existing ASME

Appendix G. This results in a safety factor of 1.8 on the principal membrane stresses. All other factors, including assumed flaw size and fracture toughness, remain the same. Although this methodology would reduce the safety factor on the principal membrane stresses, use of the proposed criteria will provide adequate margins of safety to the reactor vessel during LTOP transients.

The change will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released offsite, and there is no significant increase in the allowable individual or cumulative occupation radiation exposure.

Accordingly, the Commission concludes that this proposed action would result in no significant radiological environmental impact.

With regard to potential non-radiological impacts, the proposed change involves use of more realistic safety margins for determining the PORV setpoint during LTOP events. It does not affect non-radiological plant effluents and has no other environmental impact. Therefore, the Commission concludes that there are no significant non-radiological environmental impacts associated with the proposed action.

Alternative to the Proposed Action:

Since the Commission has concluded there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need to be evaluated.

As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are equivalent.

Alternative Use of Resources:

This action did not involve the use of any resources not previously considered in the Final Environmental Statements related to operation of the Salem Nuclear Generating Station, dated April 1973.

Agencies and Persons Consulted:

The NRC staff consulted with the state of Pennsylvania regarding the environmental impact of the proposed action. The state official had no comments.

FINDING OF NO SIGNIFICANT IMPACT:

The Commission has determined not to prepare an environmental impact statement for the proposed exemption.

Based upon the foregoing environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for exemption dated December 22, 1994, which is available for public inspection at the Commission's Public Document Room, 2120 L Street, NW., Washington, DC and at the local public document room located at the Salem Free Public Library, 112 West Broadway, Salem, New Jersey 08079.

Dated at Rockville, Maryland, this 7th day of February 1995.

FOR THE NUCLEAR REGULATORY COMMISSION

Chester Poslusny, Acting Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation