

September 22, 1993

Mr. Steven E. Miltenberger
 Vice President and Chief Nuclear
 Officer
 Public Service Electric & Gas
 Company
 Post Office Box 236
 Hancocks Bridge, New Jersey 08038

Dear Mr. Miltenberger:

SUBJECT: ROD CONTROL SYSTEM UNREVIEWED SAFETY QUESTION, SALEM NUCLEAR
 GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M86753 AND M86754)

The Commission has issued the enclosed Amendment Nos. 144 and 122 to Facility Operating License Nos. DPR-70 and DPR-75 for the Salem Nuclear Generating Station, Unit Nos. 1 and 2. These amendments consist of changes to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated June 17, 1993.

These amendments revise various UFSAR sections to address a potential single failure in the Rod Control System that is not within the current licensing basis of Salem, Units 1 and 2. These amendments are being issued pursuant to the requirements of 10 CFR 50.59(c) because the review by Public Service Electric and Gas Company identified the changes as an unreviewed safety question. No changes to the Technical Specifications are required by these amendments. However, this amendment is considered an interim measure pending completion of ongoing actions and industry initiatives to resolve this issue.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:
 James C. Stone, Senior Project Manager
 Project Directorate I-2
 Division of Reactor Projects - I/II
 Office of Nuclear Reactor Regulation

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 PDR ADDCK 05000272
 P PDR

Enclosures:

1. Amendment No. 144 to
 License No. DPR-70
2. Amendment No. 122 to
 License No. DPR-75
3. Safety Evaluation

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cc w/enclosures:
 See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 22, 1993

Docket Nos. 50-272/311

Mr. Steven E. Miltenberger
Vice President and Chief Nuclear
Officer
Public Service Electric & Gas
Company
Post Office Box 236
Hancocks Bridge, New Jersey 08038

Dear Mr. Miltenberger:

SUBJECT: ROD CONTROL SYSTEM UNREVIEWED SAFETY QUESTION, SALEM NUCLEAR
GENERATING STATION, UNITS 1 AND 2 (TAC NOS. M86753 AND M86754)

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A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

A handwritten signature in cursive script, reading "James C. Stone".

James C. Stone, Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 144 to
License No. DPR-70
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3. Safety Evaluation

cc w/enclosures:
See next page

Mr. Steven E. Miltenberger
Public Service Electric & Gas
Company

Salem Nuclear Generating Station,
Units 1 and 2

cc:

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Public Service Commission of Maryland
Engineering Division
ATTN: Chief Engineer
231 E. Baltimore Street
Baltimore, MD 21202-3486



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

PUBLIC SERVICE ELECTRIC & 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

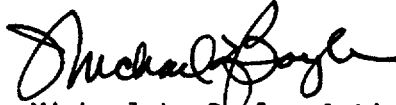
Amendment No. 144
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for amendment filed by the Public Service Electric & Gas Company (PSE&G) (the licensee), dated June 17, 1993, 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 set forth in 10 CFR Chapter I;
 - 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, by Amendment No. 144, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR) as set forth in the application for amendment by PSE&G, dated June 17, 1993. PSE&G shall update the UFSAR to reflect the revised rod control system licensing basis, authorized by this amendment, in accordance with 10 CFR 50.71(e).

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3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Michael L. Boyle". The signature is fluid and cursive, with the first name "Michael" being more prominent than the last name "Boyle".

Michael L. Boyle, Acting Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Date of Issuance: September 22, 1993



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

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PHILADELPHIA ELECTRIC COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-311

SALEM NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 122
License No. DPR-75

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
 - A. The application for amendment filed by the Public Service Electric & Gas Company (PSE&G) (the licensee), dated June 17, 1993, 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 set forth in 10 CFR Chapter I;
 - 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, by Amendment No. 122, the license is amended to authorize revision of the Updated Final Safety Analysis Report (UFSAR) as set forth in the application for amendment by PSE&G, dated June 17, 1993. PSE&G shall update the UFSAR to reflect the revised rod control system licensing basis, authorized by this amendment, in accordance with 10 CFR 50.71(e).

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Michael Boyle". The signature is fluid and cursive, with the first name "Michael" and last name "Boyle" clearly distinguishable.

Michael L. Boyle, Acting Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Date of Issuance: September 22, 1993



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 144 AND 122 TO FACILITY OPERATING
LICENSE NOS. DPR-70 AND DPR-75
PUBLIC SERVICE ELECTRIC & GAS COMPANY
PHILADELPHIA ELECTRIC COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY
SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated June 17, 1993, Public Service Electric and Gas (PSE&G or the licensee) requested an Emergency License Amendment for Salem Nuclear Generating Station (SNGS), Units 1 and 2, to the Updated Final Safety Analysis Report (UFSAR). This request concerns a change to the current licensing basis requirements to address a potential single failure identified in the Rod Control System (RCS). Investigation of an RCS failure during the startup of Salem Unit 2 has determined that a single failure in the RCS may result in a single Rod Cluster Control Assembly (RCCA) withdrawal or an asymmetric RCCA withdrawal event. The SNGS UFSAR presently states that multiple failures would be required for a single RCCA withdrawal to occur. If the identified failure is a single failure, it has not been addressed in the current licensing basis.

Based on the information currently available, the identified failure is being treated as a single failure which would result in an Unreviewed Safety Question in accordance with 10 CFR 50.59. The current UFSAR analysis for RCCA single withdrawal at power indicates that localized Departure From Nucleate Boiling (DNB) would result. This was acceptable because UFSAR Sections 4.3 and 15.3.5.1 describe single RCCA withdrawal events using the assumption that multiple failures would be required for a single RCCA withdrawal to occur. If a single failure can cause a single RCCA withdrawal or an asymmetric RCCA withdrawal, General Design Criterion (GDC) 25 which states, "The protection system shall be designed to assure that specified acceptable fuel design limits are not exceeded for any single malfunction of the reactivity control systems such as accidental withdrawal (not ejection or dropout) of control rods," is not met.

Furthermore, the identified potential single failure that could cause a single or multiple asymmetric rod withdrawal event without an urgent failure alarm involves a change to the current licensing basis for Salem Units 1 and 2, because UFSAR Section 15.3.5.1 states that a single RCCA withdrawal at power would result in an "urgent failure" and a rod "deviation alarm" on the control room console.

The staff determined that emergency approval of the potential unreviewed safety question was not required because there was no change to the technical specifications and, for the case of Salem, compliance with GDC 25 was shown. Therefore, the request was processed on a non-emergency basis. The licensee was notified of this determination before the restart of Salem, Unit 1 on June 19, 1993.

2.0 EVALUATION

The licensee has provided a justification for restart and continued operation of Salem Units 1 and 2. The basis for this justification includes an evaluation of the licensing basis safety analysis to account for the effects of the identified failure. This evaluation demonstrated that no fuel design limits are exceeded for the affected transients, which is consistent with General Design Criterion 25.

UFSAR Chapter 15 accident events were examined for adverse impact resulting from the postulated rod control system single failure. The only previously analyzed event impacted is the Single RCCA Withdrawal At Power (UFSAR 15.3.5). Multiple asymmetric RCCA withdrawals both at power and from subcritical have been evaluated based upon the postulated failure scenario. Analyses performed for Salem Units 1 and 2 showed that the single RCCA withdrawal at power event was determined to be bounded by a multiple RCCA withdrawal of two adjacent D-bank RCCAs at full-power. The multiple asymmetric RCCA withdrawal at power case was divided into three cases depending on the power level and the rods allowed to be inserted into the core in accordance with the rod insertion limits. Above 68% power, since rod insertion limits allow only D bank rods to be inserted, any number of the nine D-bank rods could withdraw. The most limiting case for the multiple asymmetric RCCA withdrawal was shown to be the withdrawal of two adjacent D-bank rods. When more than two RCCAs are withdrawn, the maximum peaking factor would be reduced as a result of the flattened power distribution.

Between 15 and 68% power, D bank and C bank RCCAs are allowed to be inserted into the core. Thus any combination of the nine D-bank and eight C-bank RCCAs could withdraw. Explicit analyses for Units 1 and 2 showed that there is no combination of asymmetric withdrawals that is more limiting than the previously mentioned limiting case. Below 15% power, where C bank and B bank rods are allowed to be inserted, any combination of the eight C-bank and B-bank RCCAs (4 for Unit 1 and 8 for Unit 2) could withdraw. Again this case is bounded by the first case.

The standard NRC-approved methodology described in WCAP-9272 was used for this analysis. Consistent with the current licensing-basis analysis in UFSAR Section 15.3.5, no rod deviation or rod control urgent failure alarm or operator action was assumed. The analysis concluded that the DNB design basis was met for the limiting case.

The final case to be considered was the asymmetric RCCA withdrawal from subcritical. Administrative measures are being imposed to preclude achieving criticality should an asymmetric rod withdrawal accident occur. This is being accomplished by maintaining the reactor coolant system boron concentration sufficient for the reactor core to remain subcritical even if all rods are postulated to spontaneously move to their fully withdrawn position.

In summary, RCCA withdrawal events resulting from the potential single failure have been evaluated against the criteria in GDC 25. The Salem-specific analyses demonstrated that the DNB design limits for the fuel are met. In addition, PSE&G has imposed compensatory actions including performing a new surveillance test prior to startup, and ensuring that operators are cognizant of the failure symptoms and applicable responses. This is considered an interim measure for Salem, Units 1 and 2, pending completion of ongoing actions and industry initiatives to resolve this concern.

Based on the staff evaluation as detailed above, and compensatory measures relative to testing and operator training, combined with existing alarms and procedures, the staff concludes that startup and continued operation of Salem, Units 1 and 2, is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

Pursuant to 10 CFR 51.21, 51.32, and 51.35, an environmental assessment and finding of no significant impact have been prepared and published (58 FR 48904) in the Federal Register on September 20, 1993. Accordingly, based upon the environmental assessment, the staff has determined that issuance of this amendment will not have a significant effect on the quality of the human environment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: M. Chatterton

Date: September 22, 1993