

November 6, 2000

Mr. Harold W. Keiser
Chief Nuclear Officer & President
PSEG Nuclear LLC - X04
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENT RE: BEACON TECHNICAL SPECIFICATION MONITORING SYSTEM (TAC NOS. MA9193 AND MA9194)

Dear Mr. Keiser:

The Commission has issued the enclosed Amendment Nos. 237 and 218 to Facility Operating License Nos. DPR-70 and DPR-75 for the Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to an application submitted by Public Service Electric and Gas Company (PSE&G) dated June 14, 2000, as supplemented by letter dated October 12, 2000.

On August 21, 2000, the licenses for Salem, to the extent held by PSE&G, were transferred to PSEG Nuclear Limited Liability Company (PSEG Nuclear). In a letter dated September 6, 2000, PSEG Nuclear stated that it has assumed responsibility, as of the date of the transfer, for the active items on the Salem dockets previously submitted by PSE&G, including the subject amendment request.

These amendments allow PSEG Nuclear LLC to use the Best Estimate Analyzer For Core Operations – Nuclear (BEACON) system at Salem to supplement the flux mapping system by providing another means of performing power distribution surveillance testing when reactor thermal power is greater than 25%.

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

Sincerely,

/RA/

Robert J. Fretz, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-272 and 50-311

Enclosures: 1. Amendment No. 237 to License No. DPR-70
2. Amendment No. 218 to License No. DPR-75
3. Safety Evaluation

cc w/encls: See next page

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3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION

PUBLIC	EAdensam	OGC	FAkstulewicz	GMeyer, RGN-I
PDI-2 Reading	JClifford	TClark	TAttard	GHill(4)
ACRS	RFretz	WBeckner	RDennig	TTjader

ACCESSION NUMBER: ML003761792 TEMPLATE = NRR-058

* SE Input provided. No major changes made.

** See previous concurrence.

OFFICE	PDI-2/PM	PDI-2/LA	SRXB/SC*	RTSB/SC*	OGC**	PDI-2/SC
NAME	RFretz	TlClark	FAkstulewicz	RDennig	RHoeffling	JClifford
DATE	11/02/00	11/2/00	10/20/00	10/17/00	11/1/00	11/3/00

OFFICIAL RECORD COPY

PSEG NUCLEAR LLC

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. 237
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 PSEG Nuclear LLC, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated June 14, 2000, as supplemented on October 12, 2000, 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, 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 and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 237, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: November 6, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 237

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages as indicated. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

IV
3/4 1-18a
3/4 1-19
3/4 2-5
3/4 2-6
3/4 2-7
3/4 2-7a
3/4 2-9
3/4 2-10
3/4 2-12

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—
—

B 3/4 2-4
B 3/4 2-5
B 3/4 3-2a
B 3/4 3-4

—

6-24
6-24a

Insert Pages

IV
3/4 1-18a
3/4 1-19
3/4 2-5
3/4 2-6
3/4 2-7
3/4 2-7a
3/4 2-9
3/4 2-10
3/4 2-12

3/4 3-70
3/4 3-71
3/4 3-72

B 3/4 2-4
B 3/4 2-5
B 3/4 3-2a
B 3/4 3-4
B 3/4 3-5

6-24
6-24a

PSEG NUCLEAR LLC

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. 218
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 PSEG Nuclear LLC, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated June 14, 2000, as supplemented on October 12, 2000, 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, 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-75 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 218, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: November 6, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 218

FACILITY OPERATING LICENSE NO. DPR-75

DOCKET NO. 50-311

Replace the following pages of the Appendix A, Technical Specifications, with the attached revised pages as indicated. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

IV
3/4 1-14
3/4 1-16
3/4 2-5
3/4 2-6
3/4 2-7
3/4 2-9
3/4 2-10
3/4 2-15
3/4 3-5

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B 3/4 2-4
B 3/4 2-5
B 3/4 3-3
B 3/4 3-4

—

6-24
6-24a

Insert Pages

IV
3/4 1-14
3/4 1-16
3/4 2-5
3/4 2-6
3/4 2-7
3/4 2-9
3/4 2-10
3/4 2-15
3/4 3-5

3/4 3-65
3/4 3-66
3/4 3-67

B 3/4 2-4
B 3/4 2-5
B 3/4 3-3
B 3/4 3-4
B 3/4 3-5

6-24
6-24a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 237 AND 218 TO FACILITY OPERATING
LICENSE NOS. DPR-70 AND DPR-75
PSEG NUCLEAR LLC
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 14, 2000, as supplemented on October 12, 2000, the Public Service Electric and Gas Company (PSE&G or licensee) submitted a request for changes to the Salem Nuclear Generating Station (Salem), Unit Nos. 1 and 2, Technical Specifications (TSs). The requested changes would allow the licensee to use the Best Estimate Analyzer For Core Operations – Nuclear (BEACON) system at Salem to perform core power distribution measurements. BEACON is a core power distribution monitoring and support system based on a three dimensional nodal code. The system will be used to provide data reduction for incore neutron flux maps, core parameter analysis and follow, and core prediction, while performing power distribution surveillance tests whenever rated thermal power (RTP) is greater than 25%. In addition, on August 21, 2000, the licenses for Salem, to the extent held by PSE&G, were transferred to PSEG Nuclear Limited Liability Company (PSEG Nuclear). By letter dated September 6, 2000, PSEG Nuclear stated that it has assumed responsibility, as of the date of the transfer, for the active items on the Salem dockets previously submitted by PSE&G, including the subject amendment request. The October 12, 2000, letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The BEACON system was developed by Westinghouse to improve the monitoring support for Westinghouse designed pressurized water reactors (PWRs). It is a core monitoring and support package which uses Westinghouse standard instrumentation in conjunction with an analytical methodology for on-line generation of three-dimensional power distributions. The system provides core monitoring, core measurement reduction, core analysis, and core predictions. The topical report WCAP-12472-P, "BEACON: Core Monitoring and Operations

Support System," was approved by the U.S. Nuclear Regulatory Commission (NRC) staff on February 16, 1994.

3.0 EVALUATION

PSEG Nuclear has requested that Salem TSs be modified to allow use of the BEACON system to perform core power distribution measurements. BEACON is a core power distribution monitoring and support system based on a three dimensional nodal code. The system is used to provide data reduction for incore neutron flux maps, core parameter analysis, and core prediction. BEACON is approved by the NRC to provide continuous core monitoring capabilities. The role for BEACON at Salem will be to supplement the flux mapping system by providing another means of performing power distribution surveillance testing when RTP is greater than 25%. This limited application of the BEACON system is referred to as BEACON Technical Specifications Monitoring (TSM). A specification has also been added to the Salem Unit Nos. 1 and 2 TS to define the conditions under which BEACON is an operable Power Distribution Monitoring System (PDMS). In addition, the proposed changes will relocate manufacturing and measurement uncertainty values associated with the power distribution measurements from the TSs to the Core Operating Limits Report (COLR).

3.1 BEACON Technical Specifications Monitoring

The use of BEACON as a PDMS has no impact upon plant operation or safety. No safety related equipment, safety function, or plant operations will be altered as a result of this proposed change. With the proposed change, the applicable Updated Final Safety Analysis Report (UFSAR) limits will be maintained and the TS will continue to require operation within the core operational limits calculated by NRC-approved methodologies. Appropriate actions to be taken if limits are violated also remain unchanged in the TS.

The following TSs have been revised to allow for use of the BEACON TSM to perform the power distribution surveillance test in lieu of the incore moveable detector system:

- 3/4.1.3.1 Movable Control Assemblies - Group Height
- 3/4.1.3.2 Movable Control Assemblies - Position Indication Systems
- 3/4.2.2 Heat Flux Hot Channel Factor
- 3/4.2.3 Nuclear Enthalpy Hot Channel Factor
- 3/4.2.4 Quadrant Power Tilt Ratio
- 3/4.3.1 Reactor Trip System Instrumentation (Unit 2 only)
- 3/4.3.14 Power Distribution Monitoring System (new).

The Salem BEACON TSM application is a limited application that uses the system to enhance the flux mapping system by providing another means of performing power distribution surveillance testing. The power distribution surveillances continue to be performed with the same periodicity, except in a few circumstances in which the surveillance will be required to be performed more frequently. More frequent surveillances include conditions involving inoperable rod position indication and nuclear instrumentation.

In WCAP-12472-P-A, the use of BEACON to continuously monitor core parameters allows for the relaxation of axial flux difference target bands. The Salem BEACON TSM application did not request this change; axial flux difference bands remain unchanged and only the surveillance

methodology changes. Therefore, the Salem BEACON TSM application is a more conservative use of BEACON than approved in WCAP-12472-P-A.

The licensee stated that the proposed change will maintain cycle-specific parameters within acceptance criteria, thus ensuring conformance to 10 CFR 50.36 by using an approved methodology. The COLR will document the specific parameter limits resulting from SGS calculations of mid-cycle or other revisions to parameter values, and the NRC-approved methodologies. Any changes to the COLR will be made in accordance with the provisions of 10 CFR 50.59. From cycle to cycle, the COLR will be revised such that the appropriate core operating limits for the applicable cycle will apply. However, the TS will not be changed.

The new TS Section 3/4.3.14 defines the conditions under which BEACON is an operable PDMS. The new TS ensures that the BEACON TSM uncertainties are applicable to the set of instrumentation which BEACON is using. The power distribution limits remain for the most part unchanged from the current TSs except that they allow a core power distribution measurement to be obtained through BEACON without using the incore movable detectors.

The criteria for the incore neutron detectors, with BEACON operable, require at least 75% of the detectors to be operable at beginning-of-cycle, and a minimum of 50% at any time afterward, with a minimum of two per quadrant. Except for lowering the criterion to 50%, this is the same as in the current STS. The 50% level is reasonable when BEACON is operable because of the increased monitoring available (e.g., from the core exit thermocouples). There is no change when BEACON is inoperable, and the minimum number of operable incore detectors remains at 75% and 4 per quadrant.

The criteria for the core exit thermocouples, with BEACON operable, require at least 25% of the thermocouples available, with at least 2 per quadrant, with the added requirement that the operable pattern normally covers all internal fuel assemblies within a chess "knight move" (an adjacent plus a diagonal square away), or there must be more frequent calibration. Calibration of the incore detectors is required every 180 effective full-power days. However, calibration is required every 30 days when the knight move requirement is not satisfied. According to the safety evaluation approving WCAP-12472-P-A, Westinghouse has analyzed the accuracy of the power distribution information with decreased incore or thermocouple detector operability, and penalties are applied to the calculated peaking factors. The review concluded that the minimum available incore and thermocouple detectors, when coupled with the increased uncertainty penalties, provide reasonable and acceptable power distribution information.

The proposed TS changes to implement BEACON TSM does not impact plant operations or safety, are consistent with the requirements of 10 CFR 50.36, will continue to require operation within the core operational limits determined by NRC-approved methodologies, and will meet or be more conservative than the technical requirements stated in Westinghouse Topical Report WCAP-12462-P-A, "BEACON: Core Monitoring and Support System," which has been approved by the NRC. Therefore, based on its review, the NRC staff finds that PSEG Nuclear's request to use the BEACON PDMS system to satisfy TS surveillance testing requirements are acceptable.

3.2 Changes to Core Operating Limits Report (COLR)

A section is to be added to the COLR addressing the definitions and the equations the PDMS or the flux mapping system uses to determine the applicable measurement uncertainties associated with the core peaking factors. The constants placed in the COLR are used as coefficients in the uncertainties calculations, and are determined by using NRC-approved methodologies. These constants are typically revised periodically to reflect cycle-specific requirements. Therefore, since this change is consistent with the requirements of 10 CFR 50.36, the staff finds this acceptable.

3.3 Summary Conclusion

Based on its review, the NRC staff finds that the licensee's request to amend the Salem TSs to use the BEACON PDMS system to satisfy surveillance testing requirements is acceptable.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, and changes surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (65 FR 46014). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 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 Contributors: A. Attard
T. Tjader

Date: November 6, 2000

PSEG Nuclear LLC

Salem Nuclear Generating Station,
Unit Nos. 1 and 2

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