June 13, 2003

Mr. Roy A. Anderson
President & Chief Nuclear Officer
PSEG Nuclear LLC - X04
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS RE: STEAM GENERATOR LOW-LOW LEVEL SETPOINTS (TAC NOS. MB6489 AND MB6490)

Dear Mr. Anderson:

The Commission has issued the enclosed Amendment Nos. 257 and 238 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 Technical Specifications (TSs) in response to your application dated September 26, 2002, as supplemented on March 20, 2003.

These amendments revise setpoint and allowable values of the steam generator (SG) low-low level trip function in TS Table 2.2-1, “Reactor Trip System Instrumentation Trip Setpoints,” and TS Table 3.3-4, “Engineered Safety Feature Actuation System Instrumentation Trip Setpoints.” The TS changes are necessary to account for a flow-induced pressure drop through the mid-deck plate inside the SG in the SG water level measurement.

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. 257 to License No. DPR-70
2. Amendment No. 238 to License No. DPR-75
3. Safety Evaluation

cc w/encls: See next page

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DISTRIBUTION

PUBLIC	JUhle	YHsii	SRhoh	GMeyer, RGN-I
PDI-2 Reading	JClifford	WBeckner	GHill(4)	OGC
ACRS	RFretz	CRaynor		

* See previous concurrence ** SE input provided. No major changes made.
ACCESSION NUMBER: ML031640004; TS(s): ML ; Package: ML

OFFICE	PDI-2/PM	PDI-2/LA	SRXB/SC**	OGC*	PDI-2/SC
NAME	RFretz	CRaynor	JUhle	RHoefling	VNerses for JClifford
DATE	5/28/03	5/28/03	04/29/03	05/27/03	6/11/03

OFFICIAL RECORD COPY

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PSEG NUCLEAR, LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 257
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment filed by PSEG Nuclear, LLC and Exelon Generation Company, LLC (the licensees), dated September 26, 2002, as supplemented March 20, 2003, 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 Title 10 of the *Code of Federal Regulations* (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. 257, 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 by VNerses for/

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: June 13, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 257

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	Insert Pages
2-6	2-6
3/4 3-26	3/4 3-26

PSEG NUCLEAR, LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-311

SALEM NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 238
License No. DPR-75

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment filed by PSEG Nuclear, LLC and Exelon Generation Company, LLC (the licensees), dated September 26, 2002, as supplemented March 20, 2003, 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 Title 10 of the *Code of Federal Regulations* (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. 238, 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 by VNerses for/

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: June 13, 2003

ATTACHMENT TO LICENSE AMENDMENT NO. 238

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	Insert Pages
2-6	2-6
3/4 3-27	3/4 3-27

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 257 AND 238 TO FACILITY OPERATING

LICENSE NOS. DPR-70 AND DPR-75

PSEG NUCLEAR, LLC

EXELON GENERATION COMPANY, LLC

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated September 26, 2002, as supplemented March 20, 2003, PSEG Nuclear, LLC (the 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 revise setpoint and allowable values of the steam generator (SG) low-low level trip function in TS Table 2.2-1, "Reactor Trip System Instrumentation Trip Setpoints," and Table 3.3-4, "Engineered Safety Feature Actuation System Instrumentation Trip Setpoints." These changes are necessary to account for a flow-induced pressure drop through the mid-deck plate inside the SG that affects instrumentation measuring SG water level. The March 20, 2003, letter from the licensee provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 REGULATORY EVALUATION

The construction permits for Salem, Unit Nos. 1 and 2, were issued by the Atomic Energy Commission (AEC) on September 25, 1968. The plants were designed and constructed based on the proposed General Design Criteria (GDC) published by the AEC in the *Federal Register* on July 11, 1967 (32 FR 10213). On February 20, 1971, the final rule that added Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "General Design Criteria for Nuclear Power Plants," was published by the AEC in the *Federal Register* (36 FR 3255). As discussed in the Updated Final Safety Analysis Report (UFSAR), Salem "was designed to comply with Public Service Electric & Gas (PSE&G's) understanding of the intent of the AEC's proposed General Design Criteria, as published for comment by the AEC in July, 1967." In a Safety Evaluation Report dated October 11, 1974, the U.S. Nuclear Regulatory Commission (NRC or the Commission, but then known as the AEC) staff concluded that the licensees for Salem have attempted to comply with the intent of the newer GDC, to the extent possible, recognizing previous design commitments. The application of the AEC's proposed GDC, and the GDC published in Appendix A to 10 CFR Part 50 in 1971, is described in the Salem UFSAR, Section 3.1.

GDC 15, "Reactor Coolant System Design," of Appendix A to 10 CFR Part 50 requires that the reactor coolant system (RCS) and associated auxiliary, control, and protection systems be

designed with sufficient margin to assure that the design conditions of the reactor coolant pressure boundary (RCPB) are not exceeded during any condition of normal operation, including anticipated operational occurrences (AOO). GDC 9 (AEC), "Reactor Coolant Pressure Boundary," as discussed in the Salem UFSAR, is consistent with Appendix A, GDC 15.

GDC 20, "Protection System Functions," requires that the protection system be designed to initiate operation of appropriate systems to ensure that specified acceptable fuel design limits (SAFDL) are not exceeded. GDC 14 (AEC), "Core Protection Systems," as discussed in the Salem UFSAR, is consistent with Appendix A, GDC 20.

On March 7, 2002, the U.S. Nuclear Regulatory Commission (NRC or Commission) issued Information Notice (IN) 2002-10 to alert holders of operating licenses for nuclear power reactors to the potential for non-conservative setpoints for steam generator water level. The IN was issued as a result of a February 9, 2002, occurrence at Diablo Canyon Power Plant, Unit 2, where the narrow-range SG water level instrumentation did not respond as expected to: (1) initiate an automatic reactor trip, and (2) actuate emergency feedwater on low-low water level in the SG during a plant trip. This event prompted Westinghouse, the SG manufacturer, to issue Nuclear Safety Advisory Letter NSAL-02-3 on February 15, 2002, and Revision 1 on April 8, 2002. Westinghouse attributed this water level discrepancy to a differential pressure (ΔP), previously unaccounted for, created by steam flow past the mid-deck plate in the moisture separator section of the SG.

Westinghouse-designed SGs incorporate a mid-deck plate to reduce moisture carryover at the top of the primary separator assembly between the upper and lower taps used for the narrow-range SG water level measurements. When some of the steam flows through the separator downcomer instead of the primary separator orifice, this steam with some entrained moisture, will eventually flow upwards through the flow area in the mid-deck plate, creating a pressure differential. The mid-deck plate ΔP, which is a function of steam flow rate, causes the SG narrow-range instrumentation to read higher than the actual water level, and adversely affects the SG low-low level trip with an uncertainty bias in the non-conservative direction. Therefore, the SG water level instrumentation without accounting for this ΔP phenomenon could be non-conservative during certain transients. Westinghouse stated that this ΔP effect may require up to an approximately 9% decrease (percent of the narrow range span) in the safety analysis limit (SAL) for establishing the low-low SG water level trip for the loss of normal feedwater transient, the loss of offsite power transient, and feedwater line break transient, to compensate for this bias.

Westinghouse provided the mid-deck plate ΔP for Model "F" and Model "51" SGs for Salem, Unit Nos. 1 and 2, respectively. The ΔP is a bias in the non-conservative direction, impacting the existing SG low-low-level setpoint. In its application dated September 26, 2002, PSEG stated that the mid-deck ΔP was not considered in the existing Salem instrument uncertainty calculations.

The low-low SG level trip function is used as a primary protection signal to initiate a reactor trip and actuation of the auxiliary feed water (AFW) for the design basis events of loss of normal feedwater, loss of offsite power, and feedwater line break. The "Steam Generator Water Level — low-low" trip function in Salem TS Tables 2.2-1 and 3.3-4 specifies the trip setpoint of $\geq$9% with an allowable value of $\geq$8% for both units. On February 16, 2002, the licensee

implemented design changes for both units to raise the setpoint and allowable value to 14% and 13%, respectively. This license amendment request is to change the Salem TSs to agree with the actual settings that are more restrictive than the current TSs.

3.0 TECHNICAL EVALUATION

The proposed TS changes would revise the low-low SG level trip setpoint and the allowable value in Tables 2.2-1 and 3.3-4 from $\geq$9% and $\geq$8%, respectively, to $\geq$14% and $\geq$13%, respectively. The changes to higher trip setpoint and allowable value are conservative relative to the existing TS. However, the changes are necessary for the correction of a non-conservative bias due to SG mid-deck plate ΔP previously unaccounted for.

By letter dated March 20, 2003, PSEG responsed to an NRC staff request for additional information, and provided the calculations of the SG low-low level setpoints and allowable values for Salem, Unit Nos. 1 and 2, including the narrow range SG water level instrumentation uncertainties. The licensee performed the calculations using the methodology approved by the NRC. The calculation of the setpoint uncertainties comprised of process effects and instrumentation loop uncertainty. The allowance for process effects accounts for the non-instrument related effects, such as process pressure variation and mid-deck plate pressure loss. These process effects are treated as biases and are combined algebraically. The instrumentation loop uncertainties address the accuracies of instrumentation, such as transmitter and rack, which are independent and random accuracies. The instrumentation loop uncertainties are statistically combined using the square-root-of-the sum-of squares (SRSS) technique.

Based on the licensee's calculations, which account for the bias of the mid-deck plate ΔP effect, the total channel uncertainties are 12.233% and 10.339% for Salem, Unit Nos. 1 and 2, respectively. The trip setpoint is determined by the SAL plus or minus uncertainty depending on the direction of conservatism. Since the design basis transient analyses assume the reactor trip and AFW actuation occurs at 0.0% SG narrow range span, the low-low SG level trip setpoint would be 12.233% and 10.339% for Salem, Unit Nos. 1 and 2, respectively. Therefore, the licensee's proposed trip setpoint of 14% for both units is conservative (with margins of 1.767% and 3.661% for Salem, Unit Nos. 1 and 2, respectively), and acceptable.

The TS allowable value is the limiting value that the trip setpoint can have when tested periodically, beyond which the instrument channel is declared inoperable and corrective action must be taken. The TS allowable values are determined by adding (or subtracting toward non-conservative direction) the allowance for: (1) instrument calibration uncertainties, (2) instrument uncertainties during normal operation, and (3) instrument drift. The licensee's calculation shows 1.151% for this allowance based on the SRSS of the rack calibration tolerance, drift, and measurement and test equipment uncertainties. Therefore, the TS allowable value of 13% for the SG low-low level trip is conservative (only 1% allowance from 14% trip setpoint), and acceptable.

With the proposed Salem, Unit Nos. 1 and 2, trip setpoint and allowable values of 14% and 13%, respectively, to account for the mid-deck plate ΔP previously unaccounted for, the existing safety analysis using the SAL of 0.0% for the SG low-low trip remains valid. This satisfies plant-specific GDC 9 (Appendix A, GDC 15), which requires that the design conditions of the reactor coolant pressure boundary not be exceeded during AOOs. This also satisfies

plant-specific GDC 14 (Appendix A, GDC 20), which requires that the protection system be designed to trip the reactor to ensure SAFDLs are not exceeded.

The NRC staff has evaluated the licensee's request to amend the Salem, Unit Nos. 1 and 2, TSs to increase the SG low-low level trip setpoint and allowable value to 14% and 13%, respectively. These changes are intended to correct the bias due to SG mid-deck plate ΔP previously unaccounted for. Based on its review, the NRC staff concludes that the proposed setpoint and allowable values are conservative and comply with the GDCs applicable to the licensing basis for Salem. Therefore, the staff concludes that the license amendment requests are 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. 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 (68 FR 5680). 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: Y. Hsii
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Date: June 13, 2003