December 1 1994

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

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 (TAC NOS. M89088 AND M89089)

Dear Mr. Eliason:

The Commission has issued the enclosed Amendment Nos. 162 and 143 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 March 28, 1994, supplemented June 1 and August 24, 1994.

These amendments revise the sustained degraded voltage relay trip setpoint and the allowable value due to changes in the switchyard configuration.

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

Sincerely,
/S/
Leonard N. Olshan, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-272/50-311

Enclosures:
1. Amendment No. 162 to License No. DPR-70
2. Amendment No. 143 to License No. DPR-75
3. Safety Evaluation

cc w/encls:
See next page

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

December 14, 1994

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

SUBJECT: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2 (TAC NOS. M89088 AND M89089)

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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. 162
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, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated March 28, 1994, as supplemented June 1, 1994, and August 24, 1994, 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. 162 , 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, to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

for

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 14, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 162

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Revise Appendix A as follows:

Remove Pages	Insert Pages
3/4 3-26	3/4 3-26

TABLE 3.3-4 (continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
5. TURBINE TRIP AND FEEDWATER ISOLATION		
A. Steam Generator Water Level -- High-High	≤ 67% of narrow range instrument span each steam generator	≤ 68% of narrow range instrument span each steam generator
6. SAFEGUARDS EQUIPMENT CONTROL SYSTEM (SEC)	Not Applicable	Not Applicable
7. UNDERVOLTAGE, VITAL BUS		
a. Loss of Voltage	≥ 70% of bus voltage	≥ 65% of bus voltage
b. Sustained Degraded Voltage	≥ 94.6% of bus voltage for ≤ 13 seconds	≥ 94% of bus voltage for ≤ 15 seconds
8. AUXILIARY FEEDWATER		
a. Automatic Actuation Logic	Not Applicable	Not Applicable
b. Manual Initiation	Not Applicable	Not Applicable
c. Steam Generator Water Level-- Low-Low	≥ 9.0% of narrow range instrument span each steam generator	≥ 8.0% of narrow range instrument span each steam generator
d. Undervoltage - RCP	≥ 70% RCP bus voltage	≥ 65% RCP bus voltage
e. S.I.	See 1 above (All S.I. setpoints)	
f. Trip of Main Feedwater Pumps	Not Applicable	Not Applicable
g. Station Blackout	See 6 and 7 above (SEC and Undervoltage, Vital Bus)	

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. 143
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, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated March 28, 1994, as supplemented June 1, 1994, and August 24, 1994, 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. 143 , 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, to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

for

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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 14, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 143

FACILITY OPERATING LICENSE NO. DPR-75

DOCKET NO. 50-311

Revise Appendix A as follows:

Remove Pages	Insert Pages
3/4 3-27	3/4 3-27

TABLE 3.3-4

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
TRIP SETPOINTS

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
7. UNDERVOLTAGE, VITAL BUS		
a. Loss of Voltage	≥ 70% of bus voltage	≥ 65% of bus voltage
b. Sustained Degraded Voltage	≥ 94.6% of bus voltage for ≤ 13 seconds	≥ 94% of bus voltage for ≤ 15 seconds
8. AUXILIARY FEEDWATER		
a. Automatic Actuation Logic	Not Applicable	Not Applicable
b. Manual Initiation	Not Applicable	Not Applicable
c. Steam Generator Water Level--Low-Low	≥ 9.0% of narrow range instrument span each steam generator	≥ 8.0% of narrow range instrument span each steam generator
d. Undervoltage - RCP	≥ 70% RCP bus voltage	≥ 65% RCP bus voltage
e. S.I.	See 1 above (all S.I. setpoints)	
f. Trip of Main Feedwater Pump	Not Applicable	Not Applicable
g. Station Blackout	See 6 and 7 above (SEC and Undervoltage, Vital Bus)	
9. SEMIAUTOMATIC TRANSFER TO RECIRCULATION		
a. RWST Low Level	15.25 ft. above Instrument taps	15.25 ± 1 ft. above instrument taps
b. Automatic Actuation Logic	Not Applicable	Not Applicable

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 162 AND 143 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 March 28, 1994, as supplemented June 1 and August 24, 1994, the Public Service Electric & Gas Company (the licensee) submitted a request for changes to the Salem Nuclear Generating Station, Unit Nos. 1 and 2, Technical Specifications (TS). The requested changes would revise the sustained degraded voltage relay trip setpoint and the allowable value due to changes in the switchyard configuration. The June 1 and August 24, 1994, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

PSE&G has implemented modifications to the Unit 1 and Unit 2 switchyard configuration that consist of new 500/13-kV station power transformers, new 13-kV circuit breakers, and new 13/4-kV station power transformers. The new equipment will continue to provide the two offsite sources of power to the three vital buses as well as power to a new non-vital 4-kV bus.

PSE&G performed calculations to support the switchyard modifications in order to determine the minimum vital bus voltage necessary to maintain vital loads within their voltage ratings without having to transfer these loads to the emergency diesel generator. These calculations also determined the minimum bus recovery voltage after a transient that would reset the undervoltage relay, preventing unnecessary transfers to the emergency diesel generators. The results of these calculations showed that a sustained degraded voltage trip setpoint of $\geq$94.6% and an allowable value of $\geq$94% will ensure that the vital bus electrical loads operate at or above their minimum operating voltage based upon the completed switchyard modifications.

In Licensee Event Report (LER) 93-014-00 dated August 20, 1993, PSE&G notified the NRC that a review of engineering calculation ES-15008(Q), "Salem Unit 1 and 2 Degraded Grid Study," showed that the present TS sustained degraded voltage trip setpoint of 91.6% may not fully protect loads served by the 4160-V vital buses should the bus voltage degrade to less than 93.2% but greater than 91.6%. As part of the LER, PSE&G committed to implement a design change to revise the sustained degraded voltage trip setpoint to no less than 93.2% in order to provide a greater margin of reliability and to enhance the level of performance of these loads. Therefore, the proposed setpoint changes address the LER commitment.

3.0 EVALUATION

PSE&G proposes to revise TS 3/4.3.2, Table 3.3-4, Item 7b, sustained degraded voltage setpoints for SGS Units 1 and 2. It proposes to change the trip setpoints from ≥91.6% of bus voltage for ≤13 seconds to ≥94.6% of bus voltage for ≤13 seconds, and the allowable value for sustained degraded voltage from ≥91% of bus voltage for ≤15 seconds to ≥94% of bus voltage for ≤15 seconds.

Two levels of undervoltage protection are provided for the loads served by the 4160-V vital buses at SGS. At first level, one undervoltage relay per 4160-V vital bus is used to sense the loss of offsite power. The second level of undervoltage protection system (SLUPS) is provided to comply with the requirement of an NRC letter dated June 2, 1977, and Branch Technical Position (BTP) PSB-1 (NUREG-0800). The SLUPS ensures that minimum voltage is maintained at the vital buses. The bus will be isolated from its offsite power source by tripping (2-out-of-3 logic) the infeed breaker and will automatically be aligned to the associated emergency diesel generator, if for any reason the bus voltage decays below the specified setpoint for more than the prescribed time.

As mentioned previously, PSE&G performed calculation to determine the optimum setpoint for the trip function on the basis of the response to various transients including a loss of coolant accident, degraded grid voltage, transformer failure and startup of the largest electrical load in accordance with the existing design basis. The setpoint also was determined on the basis of the requirement that all vital loads operate satisfactorily at or above the setpoint and following a transient, and that the bus voltage recover above the reset value of SLUPS so that unnecessary loading of the diesel generators is prevented.

The staff has reviewed the PSE&G calculations to determine if at the proposed trip setpoint and allowable value of the undervoltage relay settings provide adequate voltage at the terminals of all engineered safety features (ESF) equipment. The staff concludes that the proposed sustained degraded voltage relay trip setpoint change from ≥91.6% of bus voltage for ≤13 seconds, to ≥94.6% of bus voltage for ≤13 seconds, and the allowable value for sustained degraded voltage relay from ≥91% of bus voltage for ≤15 seconds to ≥94% of bus voltage for ≤15 seconds will ensure that vital bus loads operate at or above their minimum operating voltage and that the proposed scheme conforms to the BTP PSB-1. These changes are, therefore, acceptable.

In a conference call with the NRC staff, PSE&G clarified the following points:

(1) In response to the question as to why there is no time delay for trip setpoints and allowable value for a loss-of-voltage condition, PSE&G stated there is no specific requirement for time delay as part of the design basis for the first level of undervoltage protection. However, to allow electrical systems to recover from voltage perturbations, the relays (GE IAV) used for the first level of undervoltage protection have inverse time characteristics that will actuate the relay within a period of time in accordance with the time-voltage curve of the relay, as the voltage drops below 70 percent.

(2) The PSE&G calculations for the degraded voltage value have been analyzed down to the 120-V level in documents ES-15.005 (Unit 1) and ES-15.006 (Unit 2). These supporting documents were submitted to the NRC as attachments to the supplemental information.

(3) In response to the question as to what type of field verification was done to validate the data for the degraded voltage calculation, PSE&G stated that the data used to perform the calculation was taken from the Salem Load Management System (LMS) database. This database was developed using transformer specification and nameplate data, cable impedance data, and motor data. These data are used in conjunction with load flow software to perform various types of load flow and short circuit calculations.

(4) To control future modifications to the bus load, PSE&G follows procedure NC.NA-AP.ZZ-0008(Q), "Control of Design and Configuration Change, Tests and Experiments," and several lower-level engineering procedures that control the design change package process. Should a design change be initiated that might affect the electrical distribution system, a checklist is required to be completed that will identify the need to update the LMS database. The LMS database represents a model of the electrical distribution system at Salem, Unit 1 and 2 from the 500-kV to the 120-V level. The need to revise the degraded grid study calculation is assessed on the basis of identified changes to the LMS database.

(5) The guidance of the NRC letter of June 2, 1977, and BTP PSB-1 forms the basis of undervoltage protection at Salem, Unit 1 and 2. The proposed changes in trip setpoint and allowable value are still in compliance with both the letter and BTP PSB-1.

Conclusion

The proposed amendment will increase the minimum voltage available at the vital buses and maintain vital loads within their voltage ratings. This ensures that the minimum voltage for any load will continue to be available including during sustained degraded voltage conditions. Therefore, the proposed changes of the sustained degraded voltage relay trip setpoint from $\geq$91.6% of bus voltage for $\leq$13 seconds to $\geq$94.6% of bus voltage for $\leq$13 seconds, and the allowable value from $\geq$91% of bus voltage for $\leq$15 seconds to $\geq$94% of bus voltage for $\leq$15 seconds, will not significantly increase the probability or consequences of an accident previously evaluated. The staff finds the changes 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 (59 FR 29633). 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 Contributor: S.K. Mitra

Date: December 14, 1994