Aug t 6, 1998

Mr. Harold W. Keiser
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. MA0166 AND MA0167)

Dear Mr. Keiser:

The Commission has issued the enclosed Amendment Nos. 213 and 193 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 November 14, 1997.

These amendments revise the TSs to provide surveillance requirements for the service water accumulator vessels. Specifically, surveillance requirements are provided for vessel level, pressure and temperature, and discharge valve response time. The surveillance requirements are included in TS 3/4.6.1.1 and 3/4.6.2.3, and the applicable Bases sections are expanded to provide supporting information.

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/
Patrick D. Milano, 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. 213 to License No. DPR-70
2. Amendment No. 193 to License No. DPR-75
3. Safety Evaluation

cc w/encls: See next page

DF01 1/1

DISTRIBUTION

Docket File	RCapra	GHill(4)	JLinville, RGN-I
PUBLIC	TClark	LMarsh	THarris (E-Mail SE)
PDI-2 Reading	PMilano	WBeckner	JWermiel
JZwolinski	OGC	ACRS	CBerlinger

OFFICE	PDI-2/PM	PDI-2/LA	SPLB/C	HICB/C	SCSB/C	OGC	PDI-2/D
NAME	PMilano:rb	TClark	LMarsh	JWermiel	CBerlinger	RBachmann	RCapra
DATE	6/17/98	6/17/98	7/18/98	7/19/98	7/22/98	7/22/98	8/6/98

OFFICIAL RECORD COPY
DOCUMENT NAME: SA0166.AMD

9808140007 980806
PDR ADOCK 05000272
P PDR

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

August 6, 1998

Mr. Harold W. Keiser
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. MA0166 AND MA0167)

Dear Mr. Keiser:

The Commission has issued the enclosed Amendment Nos. 213 and 193 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 November 14, 1997.

These amendments revise the TSs to provide surveillance requirements for the service water accumulator vessels. Specifically, surveillance requirements are provided for vessel level, pressure and temperature, and discharge valve response time. The surveillance requirements are included in TS 3/4.6.1.1 and 3/4.6.2.3, and the applicable Bases sections are expanded to provide supporting information.

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

Sincerely,

Patrick D. Milano, 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. 213 to License No. DPR-70
2. Amendment No. 193 to License No. DPR-75
3. Safety Evaluation

cc w/encls: See next page

Mr. Harold W. Keiser
Public Service Electric & Gas
Company

Salem Nuclear Generating Station,
Units 1 and 2

cc:

Jeffrie J. Keenan, Esquire
Nuclear Business Unit - N21
P.O. Box 236
Hancocks Bridge, NJ 08038

General Manager - Salem Operations
Salem Nuclear Generating Station
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. Louis Storz
Sr. Vice President - Nuclear Operations
Nuclear Department
P.O. Box 236
Hancocks Bridge, NJ 08038

Senior Resident Inspector
Salem Nuclear Generating Station
U.S. Nuclear Regulatory Commission
Drawer 0509
Hancocks Bridge, NJ 08038

Dr. Jill Lipoti, Asst. Director
Radiation Protection Programs
NJ Department of Environmental
Protection and Energy
CN 415
Trenton, NJ 08625-0415

Maryland Office of People's Counsel
6 St. Paul Street, 21st Floor
Suite 2102
Baltimore, MD 21202

Ms. R. A. Kankus
Joint Owner Affairs
PECO Energy Company
965 Chesterbrook Blvd., 63C-5
Wayne, PA 19087

Mr. Elbert Simpson
Senior Vice President-
Nuclear Engineering
Nuclear Department
P.O. Box 236
Hancocks Bridge, NJ 08038

Richard Hartung
Electric Service Evaluation
Board of Regulatory Commissioners
2 Gateway Center, Tenth Floor
Newark, NJ 07102

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Lower Alloways Creek Township
c/o Mary O. Henderson, Clerk
Municipal Building, P.O. Box 157
Hancocks Bridge, NJ 08038

Manager-Licensing and Regulation
Nuclear Busienss Unit - N21
P.O. Box 236
Hancocks Bridge, NJ 08038

Mr. David Wersan
Assistant Consumer Advocate
Office of Consumer Advocate
1425 Strawberry Square
Harrisburg, PA 17120

Manager - Joint Generation
Atlantic Energy
6801 Black Horse Pike
Egg Harbor Twp., NJ 08234-4130

Carl D. Schaefer
External Operations - Nuclear
Delmarva Power & Light Company
P.O. Box 231
Wilmington, DE 19899

Public Service Commission of Maryland
Engineering Division
Chief Engineer
6 St. Paul Centre
Baltimore, MD 21202-6806

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. 213
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 November 14, 1997, 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:

9808140013 980806
PDR ADOCK 05000272
P PDR

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 213, 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

Bart C. Buckley for

Robert A. Capra, 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: August 6, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 213

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Revise Appendix A as follows:

Remove Pages	Insert Pages
3/4 6-1	3/4 6-1
3/4 6-11a	3/4 6-11a
B 3/4 6-1	B 3/4 6-1
B 3/4 6-3	B 3/4 6-3

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 PRIMARY CONTAINMENT

CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

==========

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3 and 4. * *

ACTION:

Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

==========

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated:

a. At least once per 31 days by verifying that:

   1. All penetrations* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves secured in their positions, except for valves that are opened under administrative control as permitted by Specification 3.6.3.1., and

   2. All equipment hatches are closed and sealed.

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3.

c. At least once per 12 hours by verifying that the surveillance requirements of 4.6.2.3.a are met for penetrations associated with the containment fan coil units.

d. At least once per 18 months by verifying that the surveillance requirements of 4.6.2.3.d are met for penetrations associated with the containment fan coil units.

---

*Except vents, drains, test connections, etc. which are (1) one inch nominal pipe diameter or less, (2) located inside the containment, and (3) locked, sealed, or otherwise secured in the closed position. These penetrations shall be verified closed at least once per 92 days.

* * A one-time change is granted to have the containment purge supply and/or exhaust isolation valves open in Modes 3 and 4 following the steam generator replacement outage (1R13). The cumulative time for having the valves open in Modes 3 and 4 is limited to fourteen (14) days. Each valve will be immobilized in the shut position prior to initial entry into Mode 2. The one-time exemption expires with initial entry into Mode 2 following 1R13.

SURVEILLANCE REQUIREMENTS (Continued)

a. At least once per 12 hours by:

1. Verifying the water level in each service water accumulator vessel is greater than or equal to 226 inches and less than or equal to 252 inches.

2. Verifying the temperature in each service water accumulator vessel is greater than or equal to 55°F and less than or equal to 95°F.

3. Verifying the nitrogen cover pressure in each service water accumulator vessel is greater than or equal to 135 psig and less than or equal to 160 psig.

b. At least once per 31 days by:

1. Starting (unless already operating) each fan from the control room in low speed.

2. Verifying that each fan operates for at least 15 minutes in low speed.

3. Verifying a cooling water flow rate of greater than or equal to 2550 gpm to each cooler.

c. At least once per 18 months by verifying that on a safety injection test signal:

1. Each fan starts automatically in low speed.

2. The automatic valves and dampers actuate to their correct positions and that the cooling water flow rate to each cooler is greater than or equal to 2550 gpm.

d. At least once per 18 months by verifying that on a loss of offsite power test signal, each service water accumulator vessel discharge valve response time is within limits.

3/4.6.1 PRIMARY CONTAINMENT

3/4.6.1.1 CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR 100 during accident conditions.

The service water accumulator vessel and discharge valves function to maintain water filled, subcooled fluid conditions in the containment fan coil unit (CFCU) cooling loops during accident conditions. The service water accumulator vessel and discharge valves were installed to address the Generic Letter 96-06 issues of column separation waterhammer and two phase flow during an accident involving loss of offsite power. The operability of each service water accumulator vessel and discharge valve is required to ensure the integrity of containment penetrations associated with the containment fan coil units during accident conditions. If a service water accumulator vessel does not meet the vessel surveillance requirements, or if the discharge valve response time does not meet design acceptance criteria when tested in accordance with procedures, the containment integrity requirements of the CFCU cooling loops exclusively supplied by the inoperable accumulator vessel or discharge valve are not met. Limiting Condition for Operation 3.6.1.1 is applicable, and the cooling loops for the two CFCU's exclusively supplied by the inoperable accumulator are to be removed from service and isolated to maintain containment integrity.

3/4.6.1.2 CONTAINMENT LEAKAGE

The limitations on containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the accident pressure, Pa. As an added conservatism, the measured overall integrated leakage rate(Type A test)is further limited to $\leq 0.75\ L_a$ or $\leq 0.75\ L_t$, as applicable, during performance of the periodic test to account for possible degradation of the containment leakage barriers between leakage tests.

The surveillance testing for measuring leakage rates is consistent with the Containment Leakage Rate Testing Program.

3/4.6.1.3 CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the containment air locks are required to meet the restrictions on CONTAINMENT INTEGRITY and the Containment Leakage Rate Testing Program. Surveillance testing of the air lock seals provide assurance that the overall air lock leakage will not become excessive due to seal damage during the intervals between air lock leakage tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the accident analyses.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the spray additive system ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH minimum volume and concentration, ensure that 1) the iodine removal efficiency of the spray water is maintained because of the increase in pH value, and 2) corrosion effects on components within containment are minimized. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the accident analyses.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

The OPERABILITY of the containment cooling system ensures that adequate heat removal capacity is available when operated in conjunction with the containment spray systems during post-LOCA conditions.

The surveillance requirements for the service water accumulator vessels ensure each tank contains sufficient water and nitrogen to maintain water filled, subcooled fluid conditions in three containment fan coil unit (CFCU) cooling loops in response to a loss of offsite power, without injecting nitrogen covergas into the containment fan coil unit loops assuming the most limiting single failure. The surveillance requirement for the discharge valve response time test ensures that on a loss of offsite power, each discharge valve actuates to the open position in accordance with the design to allow sufficient tank discharge into CFCU piping to maintain water filled, subcooled fluid conditions in three CFCU cooling loops, assuming the most limiting single failure.

3/4.6.3 CONTAINMENT ISOLATION VALVES

The OPERABILITY of the containment isolation valves ensures that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment. Containment isolation within the time limits specified ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA.

The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing a dedicated individual, who is in constant communication with the control room, at the valve controls, (2) instructing this individual to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment.

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. 193
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 November 14, 1997, 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. 193, 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

Bart C. Buckley for

Robert A. Capra, 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: August 6, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 193

FACILITY OPERATING LICENSE NO. DPR-75

DOCKET NO. 50-311

Revise Appendix A as follows:

Remove Pages	Insert Pages
3/4 6-1	3/4 6-1
3/4 6-13	3/4 6-13
B 3/4 6-1	B 3/4 6-1
B 3/4 6-3	B 3/4 6-3

3/4.6 CONTAINMENT SYSTEMS

3/4.6.1 PRIMARY CONTAINMENT

CONTAINMENT INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.1.1 Primary CONTAINMENT INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Without primary CONTAINMENT INTEGRITY, restore CONTAINMENT INTEGRITY within one hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.1 Primary CONTAINMENT INTEGRITY shall be demonstrated:

a. At least once per 31 days by verifying that all penetrations* not capable of being closed by OPERABLE containment automatic isolation valves and required to be closed during accident conditions are closed by valves, blind flanges, or deactivated automatic valves secured in their positions, except for valves that may be opened under Administrative control as permitted by Specification 3.6.3.1, and all equipment hatches are closed and sealed.

b. By verifying that each containment air lock is OPERABLE per Specification 3.6.1.3.

c. After each closing of a penetration subject to Type B testing, except containment air locks, if opened following a Type A or B test, by leak rate testing in accordance with the Containment Leakage Rate Testing Program.

d. At least once per 12 hours by verifying that the surveillance requirements of 4.6.2.3.a are met for penetrations associated with the containment fan coil units.

e. At least once per 18 months by verifying that the surveillance requirements of 4.6.2.3.d are met for penetrations associated with the containment fan coil units.

---

* Except vents, drains, test connections, etc. which are (1) one inch nominal pipe diameter or less, (2) located inside the containment, and (3) locked, sealed, or otherwise secured in the closed position. These penetrations shall be verified closed at least once per 92 days.

SURVEILLANCE REQUIREMENTS (Continued)

a. At least once per 12 hours by:

1. Verifying the water level in each service water accumulator vessel is greater than or equal to 226 inches and less than or equal to 252 inches.

2. Verifying the temperature in each service water accumulator vessel is greater than or equal to 55°F and less than or equal to 95°F.

3. Verifying the nitrogen cover pressure in each service water accumulator vessel is greater than or equal to 135 psig and less than or equal to 160 psig.

b. At least once per 31 days by:

1. Starting (unless already operating) each fan from the control room in low speed.

2. Verifying that each fan operates for at least 15 minutes in low speed.

3. Verifying a cooling water flow rate of greater than or equal to 2550 gpm to each cooler.

c. At least once per 18 months by verifying that on a safety injection test signal:

1. Each fan starts automatically in low speed.

2. The automatic valves and dampers actuate to their correct positions and that the cooling water flow rate to each cooler is greater than or equal to 2550 gpm.

d. At least once per 18 months by verifying that on a loss of offsite power test signal, each service water accumulator vessel discharge valve response time is within limits.

3/4.6.1 PRIMARY CONTAINMENT

3/4.6.1.1 CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

The service water accumulator vessel and discharge valves function to maintain water filled, subcooled fluid conditions in the containment fan coil unit (CFCU) cooling loops during accident conditions. The service water accumulator vessel and discharge valves were installed to address the Generic Letter 96-06 issues of column separation waterhammer and two phase flow during an accident involving loss of offsite power. The operability of each service water accumulator vessel and discharge valve is required to ensure the integrity of containment penetrations associated with the containment fan coil units during accident conditions. If a service water accumulator vessel does not meet the vessel surveillance requirements, or if the discharge valve response time does not meet design acceptance criteria when tested in accordance with procedures, the containment integrity requirements of the CFCU cooling loops exclusively supplied by the inoperable accumulator vessel or discharge valve are not met. Limiting Condition for Operation 3.6.1.1 is applicable, and the cooling loops for the two CFCU's exclusively supplied by the inoperable accumulator are to be removed from service and isolated to maintain containment integrity.

3/4.6.1.2 CONTAINMENT LEAKAGE

The limitations on containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the accident pressure, P_a. As an added conservatism, the measured overall integrated leakage rate (Type A test) is further limited to less than or equal to 0.75 L_a or less than or equal to 0.75 L_a, as applicable, during performance of the periodic test to account for possible degradation of the containment leakage barriers between leakage tests.

The surveillance testing for measuring leakage rates are consistent with the Containment Leakage Rate Testing Program.

3/4.6.1.3 CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the containment air locks are required to meet the restrictions on CONTAINMENT INTEGRITY and the Containment Leakage Rate Testing Program. Surveillance testing of the air lock seals provide assurance that the overall air lock leakage will not become excessive due to seal damage during the intervals between air lock leakage tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the containment spray system ensures that containment depressurization and cooling capability will be available in the event of a LOCA. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the accident analyses.

The containment spray system and the containment cooling system are redundant to each other in providing post accident cooling of the containment atmosphere. However, the containment spray system also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable spray system to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the spray additive system ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH volume and concentration, ensure that 1) the iodine removal efficiency of the spray water is maintained because of the increase in pH value, and 2) corrosion effects on components within containment are minimized. The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the accident analyses.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

The OPERABILITY of the containment cooling system ensures that adequate heat removal capacity is available when operated in conjunction with the containment spray systems during post-LOCA conditions.

The containment cooling system and the containment spray system are redundant to each other in providing post accident cooling of the containment atmosphere. As a result of this redundancy in cooling capability, the allowable out of service time requirements for the containment cooling system have been appropriately adjusted. However, the allowable out of service time requirements for the containment spray system have been maintained consistent with that assigned other inoperable ESF equipment since the containment spray system also provides a mechanism for removing iodine from the containment atmosphere.

The surveillance requirements for the service water accumulator vessels ensure each tank contains sufficient water and nitrogen to maintain water filled, subcooled fluid conditions in three containment fan coil unit (CFCU) cooling loops in response to a loss of offsite power, without injecting nitrogen covergas into the containment fan coil unit loops assuming the most limiting single failure. The surveillance requirement for the discharge valve response time test ensures that on a loss of offsite power, each discharge valve actuates to the open position in accordance with the design to allow sufficient tank discharge into CFCU piping to maintain water filled, subcooled fluid conditions in three CFCU cooling loops, assuming the most limiting single failure.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 213 AND 193 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 November 14, 1997, 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 (TSs). The requested changes would provide TS surveillance requirements for the service water (SW) accumulator vessels. Specifically, surveillance requirements are provided for vessel level, pressure and temperature, and discharge valve response time. The surveillance requirements are included in TS 3/4.6.1.1 and 3/4.6.2.3, and the applicable Bases sections are expanded to provide supporting information.

2.0 EVALUATION

Background

The SW system for each of the two Salem units is an open-loop cooling water system consisting of two separate headers that are normally cross connected. Each unit has six service water pumps, with three pumps aligned to each of the service water headers. There are five Containment Fan Cooler Units (CFCUs) for each unit with each service water header providing cooling water to two of the CFCUs; the fifth CFCU receives cooling water from both of the service water headers.

As part of the resolution of NRC Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," the licensee modified the CFCU piping on each unit to include two SW accumulator vessels and fast acting discharge valves. One 15,000 gallon capacity water accumulator tank is installed on each of two SW headers to the CFCU inlet piping. The modification precludes the potential for water hammer events that could challenge CFCU piping integrity and CFCU containment heat removal capability. The modification is also designed to maintain sufficient system pressure to prevent water column separation voiding and two-phase flow in this piping during accident conditions.

9808140015 980806
PDR ADOCK 05000272
P PDR

These modifications were reviewed and approved by the NRC staff and are documented in the NRC's safety evaluation supporting amendment nos. 196 and 179, dated June 19, 1997, for Salem Units 1 and 2, respectively. The licensee discussed the need for additional administrative controls regarding the operation of the system in its March 27, 1997 (LR-N97171), and April 24, 1997 (LR-N97268), submittals supporting the modifications. The licensee committed to incorporate the new administrative controls into the TSs within 90 days of entering Mode 2 (startup) on each unit.

In the November 14, 1997 letter, the licensee requested a revision to the Salem Unit 1 and 2 TSs to provide surveillance requirements (SRs) that would codify the commitment to incorporate the existing administrative procedural controls. The proposed SRs include requirements for accumulator vessel level, temperature, nitrogen overpressure and discharge valve response time. The purpose of the SRs is to provide added assurance that the SW accumulator vessels and associated discharge valves will be maintained in accordance with the design criteria to perform their safety function of maintaining the cooling water to the Containment Fan Coolers filled and in a subcooled condition as assumed during accident conditions. Specifically, the proposed SRs provide added assurance that the SW accumulator tank level, temperature and pressure will be maintained in the range established by the design. Additionally, an SR to test the accumulator vessel discharge valve response time provides added assurance that the discharge valves will be capable of opening within the time assumed by the accident analysis.

The proposed SRs are new and do not replace or modify any existing SRs. Monitoring the SW accumulator vessel level, temperature and pressure, and periodically verifying the SW accumulator discharge valve response time provides assurance that the Containment Cooling Limiting Conditions for Operation (LCO) are met and are therefore appropriate for consideration as TS Surveillance Requirements.

SW Accumulator Vessel Level

The licensee proposed to modify SR 4.6.2.3, "Containment Cooling Systems," to require SW accumulator vessel level be verified to be between 226 inches and 252 inches, inclusive, at least once per 12 hours. Accumulator vessel level is verified to ensure a sufficient inventory is maintained in each tank to supply cooling water to the CFCUs during a LOCA/LOOP until the SW pumps are re-powered from vital buses. The minimum vessel level also provides adequate inventory to prevent complete draining of a vessel if the vessel discharge valve fails open and the maximum level is set low enough to prevent a significant change in nitrogen pressure during the injection phase of operation.

The 12-hour surveillance frequency is similar and comparable to the Salem SR for the emergency core cooling system (ECCS) accumulator vessel. In addition, the TS surveillance frequency is shorter than the current daily SR committed to in letter LR-N97268, dated April 24, 1997.

The staff finds the proposed requirements for SW accumulator level and its associated surveillance frequency to be acceptable.

SW Accumulator Vessel Pressure

The licensee proposed to modify SR 4.6.2.3, "Containment Cooling Systems," to require SW accumulator vessel pressure be verified between 135 pounds per square inch (gauge) (psig) and 160 psig, inclusive, at least once per 12 hours. The minimum accumulator vessel pressure is verified to ensure a sufficient pressure is maintained in each vessel to maintain CFCU fluid pressure above saturation during LOOP/LOCA conditions. The maximum vessel pressure precludes the entire contents of the tank from being discharged into the CFCU cooling loop. The maximum pressure is within the design of the cooling system supplying cooling water to the CFCUs.

The 12-hour surveillance frequency is similar and comparable to the Salem SR for the ECCS accumulator vessel. In addition, the TS surveillance frequency is shorter than the current daily SR frequency committed to in letter LR-N97268, dated April 24, 1997.

The staff finds the proposed requirements for SW accumulator pressure to be acceptable.

SW Accumulator Vessel Temperature

The licensee proposed to modify SR 4.6.2.3, "Containment Cooling Systems," to require SW accumulator vessel temperature be verified between 55 °F and 95 °F, inclusive, at least once per 12 hours. Nitrogen solubility increases with decreasing inventory temperature. As the inventory is discharged into the CFCU cooling system piping, the pressure will decrease and nitrogen will come out of solution and become entrained in the flow. The minimum accumulator vessel temperature is verified to ensure that the amount of nitrogen that comes out of solution will not significantly affect the CFCU heat removal function. The upper temperature limit is verified to ensure the CFCU containment heat removal capability is maintained as the inventory is injected into the CFCU cooling system piping.

The 12-hour surveillance frequency is similar and comparable to the Salem SR for the ECCS accumulator vessel. In addition, the TS surveillance frequency is shorter than the current daily SR frequency committed to in letter LR-N97268, dated April 24, 1997.

The staff finds the proposed requirements for SW accumulator temperature to be acceptable.

SW Accumulator Vessel Discharge Valve Response Time

The licensee proposed to modify SR 4.6.2.3, "Containment Cooling Systems," to require SW accumulator discharge valve response time be verified within the appropriate limits by test at least once every 18 months. Discharge valve response time is critical to assuring the vessel inventory injection occurs on a LOOP/LOCA prior to the CFCU header pressure decaying below the saturation pressure. The design analysis requires that on the initiation of a loss of an offsite power signal, the vessel discharge butterfly valves stroke open to the 45 degree position in less than or equal to 1.5 seconds. Valve position indication is verified during testing by a limit switch that is included in the valve installation. Acceptable response time testing of these valves will ensure the inventory of the accumulator vessel is discharged into the CFCU piping to preclude CFCU flow column separation and two phase flow conditions during a LOOP/LOCA.

The 18-month surveillance frequency is consistent with Salem TS surveillance requirements for engineered safety features which are on an 18-month frequency. In addition, the TS surveillance frequency is consistent with the frequency committed to in letter LR-N97268, dated April 24, 1997.

The staff finds the proposed requirements for SW accumulator temperature to be acceptable.

Containment Integrity

The licensee proposed changes to TS 4.6.1.1 and Basis 3/4.6.1.1, "Containment Integrity," to reflect the fact that proper operation of the SW accumulator system, serving the CFCU cooling loops, is required to assure the continued integrity of the CFCU cooling loops during certain accident conditions. The CFCU cooling loops inside containment are containment isolation barriers. If they were to rupture during an accident, containment integrity would be threatened. The proposed additional surveillance requirements, 4.6.1.1.c. and 4.6.1.1.d., simply refer to the new surveillance requirements for the service water accumulator system, 4.6.2.3.a. and 4.6.2.3.d., respectively. This ties containment integrity to the successful surveillance and operability of the service water accumulator system, which the staff finds to be an appropriate way to assure containment integrity. Therefore, the staff finds the proposed changes to TS 4.6.1.1 and Basis 3/4.6.1.1 to be acceptable.

Administrative and Bases Changes

The staff has also reviewed the proposed administrative changes (i.e., renumbering) to SR 4.6.2.3 and the changes to Bases Section 3/4.6.2.3 for Containment Cooling System, regarding SW accumulator vessel level, pressure, and temperature and accumulator discharge valve response time and found them acceptable.

Conclusion

The staff has reviewed the proposed changes to the TS surveillance requirement SR 4.6.2.3 for the Containment Cooling System and its associated Bases. Based on its review, the staff concluded that the proposed changes to monitor SW accumulator vessel level, pressure and temperature and to test the response time of the SW accumulator discharge valves meet the requirements of 10 CFR 50.36, satisfy the licensee's commitment to codify their existing administrative controls regarding the SW accumulator vessels and associated discharge valves, and are acceptable. The proposed changes establish requirements that are appropriate and necessary for protecting the SW system from the effects of waterhammer and two phase flow conditions, thereby assuring system operability and containment integrity during LOCA/LOOP. Failure to meet any of these SRs will render the associated SW accumulator vessel inoperable. Under these conditions, containment integrity requirements for those CFCU cooling loops exclusively supplied by the inoperable accumulator vessel are not met. The affected CFCU cooling loops will be removed from service and remain isolated to maintain containment integrity.

The staff also reviewed the proposed changes to the numbering of Surveillance Requirement 3/4.6.2.3 and has found them acceptable.

The NRC staff has reviewed the proposed changes to the proposed TS surveillance requirement SR 4.6.1.1 for Containment Integrity and its associated Bases. Based on its review, the staff finds that the proposed changes assure the integrity of the CFCU cooling loops during specific accident conditions. The staff finds that the addition of the surveillance requirements with references to requirements in SR 4.6.2.3 for containment penetrations associated with the CFCUs will ensure that containment integrity conditions will be met. Therefore, the staff finds that the proposed changes are acceptable.

The licensee also expanded the Bases sections for these TS Containment Integrity TS 3/4.6.1.1 and Containment Cooling System TS 3/4.6.2.3. to provide supporting information regarding the SRs. The staff finds the added information incorporated into the TS bases to be 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

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 change 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 (63 FR 4322). 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.

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 Contributors: C. Gratton
F. Gee
J. Pulsipher

Date: August 6, 1998