April 25, 2000

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: HOPE CREEK GENERATING STATION, ISSUANCE OF AMENDMENT, RE: CORE ALTERATION DEFINITION (TAC NO. MA8444)

Dear Mr. Keiser:

The Commission has issued the enclosed Amendment No. 125 to Facility Operating License No. NPF-57 for the Hope Creek Generating Station. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated March 15, 2000.

This amendment changes TS Definition 1.7, CORE ALTERATION. The definition has been revised to be similar to the definition of CORE ALTERATION that is documented in NUREG-1433, Revision 1, "Standard Technical Specifications, General Electric Plants, BWR/4."

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/

Richard B. Ennis, Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures: 1. Amendment No. 125 to License No. NPF-57
2. Safety Evaluation

cc w/encls: See next page

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PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 125
License No. NPF-57

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

   A. The application for amendment filed by the Public Service Electric & Gas Company (PSE&G) dated March 15, 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. NPF-57 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 125, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into the license. PSE&G shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance, and shall be implemented within 3 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: April 25, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 125

FACILITY OPERATING LICENSE NO. NPF-57

DOCKET NO. 50-354

Replace the following page of the Appendix "A" Technical Specifications with the attached revised page. The revised page is identified by Amendment number and contains marginal lines indicating the areas of change.

Remove	Insert
1-2	1-2

CORE ALTERATION

1.7 CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement) are not considered to be CORE ALTERATIONS. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

CORE MAXIMUM FRACTION OF LIMITING POWER DENSITY

1.8 The CORE MAXIMUM FRACTION OF LIMITING POWER DENSITY (CMFLPD) shall be highest value of the FLPD which exists in the core.

CORE OPERATING LIMITS REPORT

1.9 The CORE OPERATING LIMITS REPORT is the unit-specific document that provides core operating limits for the current operating reload cycle. These cycle-specific core operating limits shall be determined for each reload cycle in accordance with Specification 6.9.1.9. Plant operation within these limits is addressed in individual specifications.

CRITICAL POWER RATIO

1.10 The CRITICAL POWER RATIO (CPR) shall be the ratio of that power in the assembly which is calculated by application of the applicable NRC-approved critical power correlation to cause some point in the assembly to experience boiling transition, divided by the actual assembly operating power.

DOSE EQUIVALENT I-131

1.11 DOSE EQUIVALENT I-131 shall be that concentration of I-131, microcuries per gram, which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

$\bar{E}$-AVERAGE DISINTEGRATION ENERGY

1.12 $\bar{E}$ shall be the average, weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling, of the sum of the average beta and gamma energies per disintegration, in MeV, for isotopes, with half lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME

1.13 The EMERGENCY CORE COOLING SYSTEM (ECCS) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ECCS actuation setpoint at the channel sensor until the ECCS equipment is capable of performing its safety function, i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc. Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by any series of sequential, overlapping or total steps such that the entire response time is measured.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NO. NPF-57

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

1.0 INTRODUCTION

By letter dated March 15, 2000, the Public Service Electric & Gas Company (PSE&G or the licensee) submitted a request for changes to the Hope Creek Generating Station (HCGS) Technical Specifications (TSs). The proposed amendment would change TS Definition 1.7, CORE ALTERATION. The definition would be revised to be similar to the definition of CORE ALTERATION that is documented in NUREG-1433, Revision 1, "Standard Technical Specifications, General Electric Plants, BWR/4."

2.0 BACKGROUND

The current definition of CORE ALTERATION as shown in HCGS TS Definition 1.7 is as follows:

> CORE ALTERATION shall be the addition, removal, relocation or movement of fuel, sources, incore instruments or reactivity controls within the reactor pressure vessel with the vessel head removed and fuel in the vessel. Normal movement of the SRMs, IRMs, TIPs, or special movable detectors is not considered a CORE ALTERATION. Suspension of CORE ALTERATIONS shall not preclude completion of the movement of a component to a safe conservative position.

The HCGS neutron monitoring system design includes 4 source range monitors (SRMs), with one SRM detector in each quadrant of the core. The operability requirements for the SRMs are stated in TS 3.9.2. This TS requires that at least 2 of the 4 SRM channels be operable and inserted to normal operating level in Operational Condition 5 (i.e., refueling). A note for TS 3.9.2 states that use of movable detectors during core alterations in place of the normal SRM detectors is permissible as long as these detectors are connected to the normal SRM circuits (e.g, allows the use of dunking chambers). In addition, TS 3.9.2.b requires that one of the required SRM detectors be located in the quadrant where core alterations are being performed and the other required SRM detector located in an adjacent quadrant. The Action Statement for TS 3.9.2 states that, with the requirements of the specification not satisfied, the licensee must immediately suspend all operations involving core alterations and insert all insertable control rods.

The current HCGS TS Definition 1.7 considers the removal of incore instrumentation to be a core alteration. Based on the requirements in TS 3.9.2.b, if one SRM became inoperable in

Operational Condition 5 while the vessel was fully fueled, the SRM could not be replaced because:

1) Removal of the SRM would be considered a core alteration;

2) There would not be an operable SRM in the quadrant where the core alteration was being performed; and

3) A fully fueled vessel does not provide a location for insertion of a moveable detector.

The current definition of core alteration in conjunction with the operability requirements for the SRMs does not allow core monitoring to be restored in the affected quadrant under the conditions described above. Therefore, the licensee has proposed to revise TS Definition 1.7 to read as follows:

> CORE ALTERATION shall be the movement of any fuel, sources, or reactivity control components, within the reactor vessel with the vessel head removed and fuel in the vessel. Movement of source range monitors, local power range monitors, intermediate range monitors, traversing incore probes, or special movable detectors (including undervessel replacement) are not considered to be CORE ALTERATIONS. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe position.

3.0 EVALUATION

3.1 Licensee's Justification

The licensee's submittal provided the following justification for the proposed changes:

> A CORE ALTERATION is a specific activity conducted while in Operational Condition 5, "Refueling," requiring additional controls to be in place. The following requirements are enforced while performing CORE ALTERATIONS:
>
> - Shutdown margin as required by TS Section 3/4.1.1, "Shutdown Margin," must be maintained while in Operational Condition 5, and core alterations must be suspended if shutdown margin requirements cannot be met;
>
> - Neutron monitoring and manual scram functions provided by the reactor protection system, required by TS Section 3/4.3.1, "Reactor Protection System Instrumentation," must be maintained while in Operational Condition 5, core alterations are required to be suspended except for replacement of local power ranger monitor (LPRM) strings provided SRM instrumentation is operable as required by TS Section 3.9.2, "Instrumentation;"
>
> - TS Section 3.9.1, "Reactor Mode Switch," requires that the reactor mode switch shall be operable and locked in the shutdown or refuel position while in Operational Condition 5. If the mode switch is not locked in "Refuel," core alterations shall not be performed unless the refuel position interlocks are operable. Core alterations are to be suspended if the mode switch conditions can not be met, or if applicable, the refueling interlocks are inoperable;

- Two SRMs are required to be operable, with one SRM located in the quadrant where core alterations are being performed, and the other SRM located in an adjacent quadrant, per TS 3.9.2, “Instrumentation.” If this condition is not met, all core alterations are to be suspended.

- TS Section 3.9.3, “Control Rod Position,” requires all control rods to be inserted during core alterations, except control rods removed per TS 3.9.10.1, “Single Control Rod Removal,” and TS 3.9.10.2, “Control Rod Removal;”

- TS Section 3.9.5, “Communications,” requires that direct communications be maintained between the control room and the refueling platform personnel during core alterations;

- TS Section 3.9.10.1 and TS Section 3.9.10.2 require that SRMs and the reactor mode switch are operable, with adequate shutdown margin demonstrated, and that appropriate restrictions are [in] place for control rods prior to the removal of a control rod.

The requirement for defining a specific activity (i.e., core alterations), in Operational Condition 5, is to ensure that additional controls are in place to protect against or mitigate a reactivity excursion or fuel assembly drop when moving reactivity control elements. The requirement to demonstrate shutdown margin ensures that the reactor will be maintained sufficiently subcritical to preclude an inadvertent criticality in the shutdown condition. The neutron monitoring instrumentation and the associated reactor protection system trips provide protection against a “reactivity excursion.”

The requirements related to the reactor mode switch ensure that the restrictions on control rod withdrawal and refueling platform movement during refueling are properly activated. These conditions reinforce the refueling procedures and reduce the probability of inadvertent criticality, damage to the reactor internals and fuel assemblies, and exposure of personnel to excessive radiation.

The requirement that all control rods be inserted during core alterations ensures that fuel will not be loaded into a cell without a control rod.

The requirement for communications capability ensures that refueling platform personnel can be promptly informed of significant changes in facility status or core reactivity conditions during movement of fuel within the reactor pressure vessel.

TS requirements related to removal of control rods ensure that maintenance or repair of control rods is performed under conditions that limit the probability of inadvertent criticality.

In RFO9 [refueling outage 9], the SRM and IRM [intermediate range monitor] detectors and their associated dry tubes will be replaced to enhance the material condition and reliability of those components. Movement of the SRMs and IRMs in a non-normal manner would constitute core alterations under the current TS definition. The proposed change permits these activities to be performed while

not being considered CORE ALTERATIONS. This is expected to produce appreciable savings in outage critical path.

The proposed change to the definition of CORE ALTERATIONS limits the definition of movement to only those components that can affect core reactivity, primarily fuel assemblies and control rods. Unlike the ITS [Improved Technical Specifications], the proposed changes conservatively do not permit the movement of control rods in defueled cells. The neutron monitoring requirement is applicable at all times while in Operational Condition 5. The proposed change recognizes that the movement of neutron monitoring fission chambers used in boiling water reactors does not significantly affect core reactivity, and places no restrictions on their movement/removal. This is consistent with the current TS in that normal movement of SRMs, IRMs and special movable detectors are not considered to be CORE ALTERATIONS.

Approval of the above changes will enable Hope Creek to more efficiently perform the SRM and IRM detector and dry tube replacements, while minimizing the dose to refueling platform personnel since either a full core off load would be avoided or the number of required refueling bridge tool changes will be reduced. Command and control of CORE ALTERATIONS is not impacted by the proposed changes. Direct communications will be maintained between the control room and the refueling platform personnel during CORE ALTERATIONS as required by TS Section 3.9.5. The refuel floor supervisor will continue to observe and supervise the removal and replacement of SRMs and IRMs, as well as other detectors and control blades, within the reactor pressure vessel.

Provisions to limit potential offsite exposures in the event of a significant release of radioactivity from loads transported over irradiated fuel will be maintained. Secondary containment will be implemented and controlled by station administrative procedures during core alterations and during movement of control blades over irradiated fuel. Secondary containment consists of [ ] the Filtration, Recirculation and Ventilation System (FRVS) that provides a charcoal filter on the ventilation exhaust prior to discharging to the environment and associated radiation monitors that isolate secondary containment on high radiation.

The proposed changes do not impact the requirements for refueling evolutions associated with shutdown margin, core monitoring, and reactor protection system operability. The existing TS requirements will also require the insertion of all insertable control rods when sufficient SRMs and IRM[s] are not operable. Secondary containment will continue to be required during CORE ALTERATIONS. There are no changes made to assumptions used [in] the accident analyses. The SRM and IRM maintenance activities may be performed safely and without any undue risk to the public when conducted in accordance with the proposed changes.

3.2 NRC Staff's Review

The licensee's proposed changes to TS Definition 1.7 limit the definition of core alteration to only those components that can affect core reactivity (i.e., fuel, sources, or reactivity control components). The licensee has proposed that movement of SRMs, LPRMs, IRMs, traversing incore probes, or special movable detectors (including undervessel replacement) would not be considered core alterations.

The proposed HCGS core alteration definition is nearly identical to the ITS (i.e., NUREG-1433, Revision 1) definition with respect to excluding movement of neutron detectors from being considered a core alteration. However, unlike the ITS, the proposed changes conservatively do not permit movement of control rods in defueled cells.

The intent of the core alteration definition is to define specific activities that could cause a change in core reactivity while in Operational Condition 5. When these specific activities are taking place, additional controls need to be put in place to ensure that inadvertent criticality does not occur in the shutdown condition. In Operation Condition 5, a reactivity excursion could cause fuel damage and subsequent release of radioactive material to the environment. Prevention and mitigation of reactivity excursions while conducting core alterations during Operational Condition 5 are provided by the TSs described above in the licensee's justification.

The licensee's submittal states that the SRM and IRM detectors and their associated dry tubes will be replaced during RFO9. During the course of the staff review, a concern was raised whether the proposed TS change could be interpreted to allow all the SRMs and IRMs to be intentionally removed from service simultaneously while fuel was in the vessel in order to save time during the outage. The staff's position is that intentional entry into a TS Action Statement should not be made for operational convenience. This position is related to NRC Inspection Manual Part 9900, "Technical Guidance" and also to Standard Technical Specification LCO 3.0.2 which specifies compliance with remedial measures (TS Actions) must be met during non-compliance with LCOs required by 10 CFR 50.36. Entry into actions as specified by TS LCO 3.0.2 are interpreted to mean that the TS Actions also apply when a component or system is removed from service intentionally. These limitations apply to, but are not limited to performance of surveillances, preventative maintenance, corrective maintenance or for investigation of operational problems and must be done in a manner that does not compromise safety. Furthermore, intentional entry into Actions should not be made for operational convenience. In addition, General Design Criteria (GDC) 13, of Appendix A to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, requires, in part, that instrumentation shall be provided to monitor variables and systems over their anticipated ranges including those variables and systems that can affect the integrity of the reactor core. This GDC further states that appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges. Simultaneous intentional removal of all the SRMs and IRMs while the reactor is fueled would be considered unacceptable to the staff since it would leave the core without any neutron monitoring, thus not meeting the requirements of GDC 13. The operability requirements for the SRMs are specified in TS 3.9.2, while TS 3.3.1 provides the operability requirements for the IRMs. The staff concludes that these TS requirements as well as GDC 13 provide assurance that the required number of SRMs and IRMs will remain operable in Operational Condition 5 and that adequate neutron monitoring will be provided when fuel is in the vessel.

The staff has reviewed the licensee's submittal and finds that:

1) The movement of neutron detectors in Operation Condition 5 will not have any significant effect on core reactivity and should not be considered core alterations;

2) Additional controls are in place as required by the current TSs to ensure that inadvertent criticality does not occur in the shutdown condition including assuring that the required number of SRMs and IRMs are operable while fuel is in the vessel; and

3) The proposed definition of core alteration will allow an inoperable SRM to be restored to operable status in Operational Condition 5 thus restoring core monitoring to the affected quadrant.

Therefore, the proposed changes to TS Definition 1.7 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 amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (65 FR 15657). Accordingly, the amendment meets 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 amendment.

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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: R. Ennis

Date: April 25, 2000