February 26, 1996

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: HOPE CREEK GENERATING STATION (TAC NO. M94603)

Dear Mr. Eliason:

The Commission has issued the enclosed Amendment No. 94 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 February 5, 1996, as supplemented by letter dated February 14, 1996.

The amendment changes TSs 4.6.2.2b, "Suppression Pool Spray," and 4.6.2.3b, "Suppression Pool Cooling," to include flow through the RHR heat exchanger bypass line (in addition to the RHR heat exchanger) in the Suppression Pool Cooling and Suppression Pool Spray flow path used during RHR pump testing.

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

Sincerely,
Original signed by:
David H. Jaffe, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures: 1. Amendment No. 94 to License No. NPF-57
2. Safety Evaluation

cc w/encls: See next page

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

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

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 94
License No. NPF-57

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 (PSE&G) dated February 5, 1996, as supplemented by letter dated February 14, 1996, 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. 94 , 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

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: February 26, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 94

FACILITY OPERATING LICENSE NO. NPF-57

DOCKET NO. 50-354

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
3/4 6-15	3/4 6-15
3/4 6-16	3/4 6-16
B 3/4 6-4	B 3/4 6-4
---	B 3/4 6-4a

SUPPRESSION POOL SPRAY

LIMITING CONDITION FOR OPERATION

3.6.2.2 The suppression pool spray mode of the residual heat removal (RHR) system shall be OPERABLE with two independent loops, each loop consisting of:

a. One OPERABLE RHR pump, and

b. An OPERABLE flow path capable of recirculating water from the suppression chamber through an RHR heat exchanger and the suppression pool spray sparger.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

a. With one suppression pool spray loop inoperable, restore the inoperable loop to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With both suppression pool spray loops inoperable, restore at least one loop to OPERABLE status within 8 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN* within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 The suppression pool spray mode of the RHR system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve, manual, power operated or automatic, in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. By verifying that each of the required RHR pumps develops a flow of at least 500 gpm on recirculation flow through the RHR heat exchanger, its associated closed bypass valve, and suppression pool spray sparger when tested pursuant to Specification 4.0.5.

*Whenever both RHR subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

CONTAINMENT SYSTEMS

SUPPRESSION POOL COOLING

LIMITING CONDITION FOR OPERATION

3.6.2.3 The suppression pool cooling mode of the residual heat removal (RHR) system shall be OPERABLE with two independent loops, each loop consisting of:

a. One OPERABLE RHR pump, and

b. An OPERABLE flow path capable of recirculating water from the suppression chamber through an RHR heat exchanger.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

a. With one suppression pool cooling loop inoperable, restore the inoperable loop to OPERABLE status within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

b. With both suppression pool cooling loops inoperable, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN* within the next 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.3 The suppression pool cooling mode of the RHR system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve, manual, power operated or automatic, in the flow path that is not locked, sealed or otherwise secured in position, is in its correct position.

b. By verifying that each of the required RHR pumps develops a flow of at least 10,000 gpm on recirculation flow through the RHR heat exchanger, its associated closed bypass valve, and the suppression pool when tested pursuant to Specification 4.0.5.

*Whenever both RHR subsystems are inoperable, if unable to attain COLD SHUTDOWN as required by this ACTION, maintain reactor coolant temperature as low as practical by use of alternate heat removal methods.

DEPRESSURIZATION SYSTEMS (Continued)
tested during the Humboldt Bay and Bodega Bay tests was 170°F and this is conservatively taken to be the limit for complete condensation of the reactor coolant, although condensation would occur for temperatures above 170°F.

Should it be necessary to make the suppression chamber inoperable, this shall only be done as specified in Specification 3.5.3.

The Hope Creek design contains a bypass line around each of the RHR heat exchangers. The line contains a valve that is used for adjusting flow through the heat exchanger. The valve is not designed to be a tight shut-off valve. With the bypass valve closed, a portion of the total flow travels through the bypass line, which can affect overall heat transfer, although no heat transfer performance requirement of the heat exchanger is intended by the Technical Specification RHR pump Surveillance Requirements.

One of the Surveillance Requirements for the Suppression Pool Cooling (SPC) and Suppression Pool Spray (SPS) modes of the RHR system demonstrate that each RHR pump develops the required flowrate while operating in the applicable mode with flow through the associated heat exchanger and its closed bypass valve. Verifying that each RHR pump develops the required flow rate, while operating in the applicable mode with flow through the heat exchanger and its associated closed bypass valve, ensures that pump performance has not degraded during the cycle. Flow is a normal test of centrifugal pump performance required by ASME Code, Section XI. This test confirms one point on the pump baseline curve and is indicative of overall performance. Such inservice inspections confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance.

Under full power operating conditions, blowdown from an initial suppression chamber water temperature of 95°F results in a water temperature of approximately 135°F immediately following blowdown which is below the 200°F used for complete condensation via mitered T-quencher devices. At this temperature and atmospheric pressure, the available NPSH exceeds that required by both the RHR and core spray pumps, thus there is no dependency on containment overpressure during the accident injection phase. If both RHR loops are used for containment cooling, there is no dependency on containment overpressure for post-LOCA operations.

Experimental data indicates that excessive steam condensing loads can be avoided if the peak local temperature of the suppression pool is maintained below 200°F during any period of relief valve operation. Specifications have been placed on the envelope of reactor operating conditions so that the reactor can be depressurized in a timely manner to avoid the regime of potentially high suppression chamber loadings.

DEPRESSURIZATION SYSTEMS (Continued)

Because of the large volume and thermal capacity of the suppression pool, the volume and temperature normally changes very slowly and monitoring these parameters daily is sufficient to establish any temperature trends. By requiring the suppression pool temperature to be frequently recorded during periods of significant heat addition, the temperature trends will be closely followed so that appropriate action can be taken. The requirement for an external visual examination following any event where potentially high loadings could occur provides assurance that no significant damage was encountered. Particular attention should be focused on structural discontinuities in the vicinity of the relief valve discharge since these are expected to be the points of highest stress.

In addition to the limits on temperature of the suppression chamber pool water, operating procedures define the action to be taken in the event a safety-relief valve inadvertently opens or sticks open. As a minimum this action shall include: (1) use of all available means to close the valve, (2) initiate suppression pool water cooling, (3) initiate reactor shutdown, and (4) if other safety-relief valves are used to depressurize the reactor, their discharge shall be separated from that of the stuck-open safety relief valve to assure mixing and uniformity of energy insertion to the pool.

In conjunction with the Mark I containment Long Term Program, a plant unique analysis was performed which demonstrated that the containment, the attached piping and internal structures meet the applicable structural and mechanical acceptance criteria for Hope Creek. The evaluation followed the design basis loads defined in the Mark I Load Definition Report, NEDO-21888, December 1978, as modified by NRC SER NUREG 0661, July 1980 and Supplement 1, August 1982, to ensure that hydrodynamic loads, appropriate for the life of the plant, were applied.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 94 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 February 5, 1996, as supplemented by letter dated February 14, 1996, the Public Service Electric & Gas Company (the licensee) submitted a request for changes to the Hope Creek Generating Station (HCGS), Technical Specifications (TS). The proposed amendment would change TSs 4.6.2.2b, "Suppression Pool Spray," and 4.6.2.3b, "Suppression Pool Cooling," to include flow through the RHR heat exchanger bypass line (in addition to the RHR heat exchanger) in the Suppression Pool Cooling and Suppression Pool Spray flow path used during RHR pump testing. The February 14, 1996 letter provided clarifying information that did not change the initial proposed no significant hazards consideration determination nor the Federal Register notice.

2.0 DISCUSSION

The HCGS RHR, as described in Section 5.4.7 of the HCGS Updated Final Safety Analysis Report, consists of four independent loops which are designated as A, B, C, and D. Each loop contains a motor-driven pump, piping, valves, instrumentation and controls. Each loop takes suction from the suppression pool and is capable of discharging water to the reactor vessel via separate low pressure coolant injection (LPCI) nozzles, or back to the suppression pool via a full flow test line. Loops A and B have heat exchangers that each contain a bypass line, with a "butterfly" control valve, to control flow through the RHR heat exchangers. Discharge flow from the RHR and bypass line can be manually diverted to containment spray (which includes suppression pool spray (SPS)) or suppression pool cooling (SPC).

At the present, TS 4.6.2.2b requires that, "...each of the RHR pumps develops a flow of at least 500 gpm on recirculation flow through the RHR heat exchanger and suppression pool spray sparger when tested pursuant to Specification 4.0.5." Similarly, TS 4.6.2.3b requires that, "...each of the RHR pumps develops a flow of at least 10,000 gpm on recirculation flow

through the RHR heat exchanger and the suppression pool when tested pursuant to Specification 4.0.5." The February 5, 1996 application would add the words "its associated closed bypass valve," after the words "RHR heat exchanger," to TS 4.6.2.2b and 4.6.2.3b to include the Residual Heat Removal (RHR) heat exchanger bypass line flow as a component of the total, verified, flow rates.

3.0 EVALUATION

The use of a "butterfly" valve in an RHR heat exchanger bypass line results in good flow control but poor leak-tightness as demonstrated by industry experience. The valves in question are 18 inch, 7600 Series, Butterfly Control Valves provided by Fisher Controls and are designated as valve numbers F048A and F048B. Leak-tightness is not a requirement in this case, as indicated in the February 5, 1996 application, in that only 8985 gpm (of the total RHR pump flow in the SPC mode) is required for RHR heat exchanger flow for the limiting SPC heat removal capability. Heat removal in the SPS mode was found by the licensee to be bounded by the SPC heat removal capability. As indicated in the February 14, 1996 supplement, testing, by the licensee, during the current refuel outage, resulted in a demonstration that flow through the "A" RHR heat exchanger is 9968 gpm while flow through the "B" heat exchanger is 9648 gpm. In order to perform this test, a temporary flow monitor was located at the outlet of each RHR heat exchanger. The licensee has committed to perform the RHR heat exchanger flow test, in the SPC mode, once per operating cycle (not to exceed 24 months). In addition, the licensee has committed to perform valve performance testing of the RHR heat exchanger bypass "butterfly" valves, to test proper valve stroke, on a quarterly basis.

Based upon the above, the NRC staff concludes that the currently demonstrated flow through the RHR heat exchangers is adequate and that bypass flow is not excessive considering the selection of a "butterfly" valve for flow control. In addition, the proposed periodic testing of RHR heat exchanger flow, and "butterfly" valve leakage, will detect component degradation in a timely manner. Accordingly, the addition of the words "its associated closed bypass valve," after the words "RHR heat exchanger," to TS 4.6.2.2b and 4.6.2.3b, is acceptable. The NRC staff has also reviewed the proposed changes to the TS Bases for TS 4.6.2 and finds these changes to be acceptable.

4.0 EXIGENT CIRCUMSTANCES

The need to resolve issues associated with RHR heat exchanger bypass leakage was recognized after HCGS was shut down for the current refueling cycle. Since the February 5, 1996, proposed license amendment is needed prior to entry into Operational Condition 3 on February 27, 1996, the licensee has requested that the NRC staff consider the application on an exigent basis.

The NRC staff has reviewed the licensee's application for license amendment and finds that (1) the exigent circumstances exist, as provided in 10 CFR 50.91(a)(6), in that the licensee and the Commission must act quickly and that time does not permit the Commission to publish a Federal Register notice allowing 30 days for prior public comment, and (2) that the licensee has not

failed to use its best efforts to make a timely application and avoid creating the exigent circumstance. The Commission noticed the licensee's February 5, 1996 application for license amendment in the Federal Register on February 9, 1996 (61 FR 5040), at which time the Commission made a proposed finding that the proposed amendment involved no significant hazards consideration and there has been no public comment in response to the notice.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 provide that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the amendment:

1. **Will not involve a significant increase in the probability or consequences of an accident previously analyzed.**

   The proposed amendment request changes Surveillance Requirement (SR) 4.6.2.3.b of Technical Specification (TS) 3.6.2.3, Suppression Pool Cooling, and SR 4.6.2.2.b of TS 3.6.2.2, Suppression Pool Spray, to clarify that the intent of these specific SRs is to confirm Residual Heat Removal (RHR) pump performance during Suppression Pool Cooling (SPC) and Suppression Pool Spray (SPS) operation. The proposed change revises the SRs to include the RHR heat exchanger bypass line, with the bypass valve closed, and the RHR heat exchanger in the SPC and SPS flow path used during performance of the surveillance.

   The RHR system is an accident mitigation system. The proposed changes do not change the operation or capabilities of the RHR system in either mode of operation. The proposed changes do not involve any physical changes to the RHR system. The proposed changes merely modify the acceptable flow path for the surveillance tests; the purpose of which is to verify pump performance in these modes of operation. Therefore, the proposed change to the SRs for the SPC and SPS mode of operation of the RHR system will not increase the probability of an accident previously evaluated.

   Furthermore, the performance of the RHR system in any of its operational modes will be unchanged by the proposed change. The changes affect only the pump performance SRs for the SPC and SPS modes of RHR system operation. The surveillances being changed only modify the acceptable flow path used during the performance of the pump performance surveillance. The surveillances still verify that pump performance has not degraded to a point where the accident mitigation function of the system has been compromised. Therefore, the proposed change will not involve an increase in the consequences of an accident previously evaluated.

2. **Will not create the possibility of a new or different kind of accident from any previously evaluated.**

   The proposed change, a clarification of the SPC and SPS mode flow paths for pump performance testing, does not result in a modification of the RHR system, change the method of SPC or SPS operation, or alter the system's effectiveness. Suppression Pool Cooling and Containment Spray Cooling, of which Suppression Pool Spray is a part, are manually initiated actions. Existing procedures for the initiation of these two modes of operation are unchanged, including the requirement that the Low Pressure Coolant Injection valve is closed before the containment spray valves can be opened. There are no new failure modes created by the proposed changes and no new accident initiating events are created. Therefore, the proposed changes will not create the possibility of a new or different kind of accident from any previously evaluated.

3. **Will not involve a significant reduction in a margin of safety.**

   The proposed changes do not change the operation of the RHR system in any of its modes of operation. The changes only clarify the fact that the purpose of the SRs is to confirm RHR pump performance through the most restrictive conditions of the flow path while operating in either the SPC or SPS modes. The changed surveillance still verify that pump performance has not degraded to a point where the original design basis can not be met. In order to assure the system meets its original design basis, adequate flow through the heat exchanger during surveillance testing will be maintained. Since the function of all of the operational modes of the RHR system are unaffected by the revised surveillance test flow path, the proposed changes will maintain the existing margin of safety.

Based upon the above, the Commission has made a final determination that the proposed amendment involves no significant hazards consideration.

6.0 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.

7.0 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 and changes surveillance requirements. 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 made a final finding

that the amendment involves no significant hazards consideration. 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.

8.0 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: D. H. Jaffe

Date: February 26, 1996