November 30, 1995

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. M89220)

Dear Mr. Eliason:

The Commission has issued the enclosed Amendment No. 89 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 31, 1994, and supplemented by letters dated August 29, and October 16, 1995.

The change to Technical Specification (TS) 3.5.1, "ECCS - Operating," and associated Bases, establishes a new allowed out-of-service time. Action c.2 for TS 3.5.1 allows any one Low Pressure Coolant Injection subsystem, or one Core Spray subsystem, to be inoperable in addition to an inoperable High Pressure Coolant Injection system, for 72 hours.

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/
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. 89 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

November 30, 1995

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Docket No. 50-354

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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. 89
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 March 31, 1994, and supplemented by letters dated August 29, and October 16, 1995, 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. 89 , 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 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Donald S. Brinkman 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: November 30, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 89

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 5-3	3/4 5-3
B 3/4 5-2	B 3/4 5-2
B 3/4 5-3	B 3/4 5-3

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

1. With the HPCI system inoperable, restore the HPCI system to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤200 psig within the following 24 hours.

2. With the HPCI system inoperable and either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI system to operable status within 72 hours or restore the LPCI subsystem/CSS subsystem to operable status within 72 hours. Otherwise, be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤ 200 psig in the next 24 hours.

d. For the ADS:

1. With one of the above required ADS valves inoperable, provided the HPCI system, the core spray system and the LPCI system are OPERABLE, restore the inoperable ADS valve to OPERABLE status within 14 days or be in at least HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to ≤100 psig within the next 24 hours.

2. With two or more of the above required ADS valves inoperable, be in at least HOT SHUTDOWN within 12 hours and reduce reactor steam dome pressure to ≤100 psig within the next 24 hours.

e. With a CSS and/or LPCI header ΔP instrumentation channel inoperable, restore the inoperable channel to OPERABLE status within 7 days or determine the ECCS header ΔP locally at least once per 12 hours; otherwise, declare the associated ECCS subsystem inoperable.

f. The discharge line "keep filled" alarm instrumentation associated with a LPCI and/or CSS subsystem(s) may be in an inoperable status for up to 6 hours for required surveillance testing* provided that the "keep filled" alarm instrumentation associated with at least one LPCI or CSS subsystem serviced by the affected "keep filled" system remains OPERABLE; otherwise, perform Surveillance Requirement 4.5.1.a.1.a.

g. In the event an ECCS system is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date. The current value of the usage factor for each affected safety injection nozzle shall be provided in this Special Report whenever its value exceeds 0.70.

* This includes testing of the "Reactor Coolant System Interface Valves Leakage Pressure Monitors" associated with LPCI and CSS in accordance with Surveillance 4.4.3.2.3

ECCS-OPERATING and SHUTDOWN (Continued)

With the HPCI system inoperable, adequate core cooling is assured by the OPERABILITY of the redundant and diversified automatic depressurization system and both the CSS and LPCI systems. In addition, the reactor core isolation cooling (RCIC) system, a system for which no credit is taken in the safety analysis, will automatically provide makeup at reactor operating pressures on a reactor low water level condition. The HPCI out-of-service period of 14 days is based on the demonstrated OPERABILITY of redundant and diversified low pressure core cooling systems and the RCIC system. If any one LPCI subsystem or one CSS subsystem is inoperable in addition to an inoperable HPCI system, the inoperable LPCI subsystem/CSS subsystem or the HPCI system must be restored to OPERABLE status within 72 hours. In this condition, adequate core cooling is ensured by the OPERABILITY of the automatic depressurization system (ADS) and the remaining low pressure ECCS subsystems. However, the overall ECCS reliability is reduced because a single failure in one of the remaining OPERABLE subsystems concurrent with a design basis LOCA may result in reduced ECCS capability to perform its intended safety function. Since both a high pressure system (HPCI) and a low pressure subsystem are inoperable, a more restrictive Completion Time of 72 hours is required to restore either the HPCI system or the LPCI/CSS subsystem to OPERABLE status.

The surveillance requirements provide adequate assurance that the HPCI system will be OPERABLE when required. Although all active components are testable and full flow can be demonstrated by recirculation through a test loop during reactor operation, a complete functional test with reactor vessel injection requires reactor to be in HOT SHUTDOWN with vessel pressure not less than 200 psig. The pump discharge piping is maintained full to prevent water hammer damage and to provide cooling at the earliest moment.

Upon failure of the HPCI system to function properly after a small break loss-of-coolant accident, the automatic depressurization system (ADS) automatically causes selected safety-relief valves to open, depressurizing the reactor so that flow from the low pressure core cooling systems can enter the core in time to limit fuel cladding temperature to less than 2200°F. ADS is conservatively required to be OPERABLE whenever reactor vessel pressure exceeds 100 psig. This pressure is substantially below that for which the low pressure core cooling systems can provide adequate core cooling for events requiring ADS.

ADS automatically controls five selected safety-relief valves although the safety analysis only takes credit for four valves. It is therefore appropriate to permit one valve to be out-of-service for up to 14 days without materially reducing system reliability.

3/4.5.3 SUPPRESSION CHAMBER

The suppression chamber is required to be OPERABLE as part of the ECCS to ensure that a sufficient supply of water is available to the HPCI, CSS and LPCI systems in the event of a LOCA. This limit on suppression chamber minimum water volume ensures that sufficient water is available to permit recirculation cooling flow to the core. The OPERABILITY of the suppression chamber in OPERATIONAL CONDITIONS 1, 2 or 3 is also required by Specification 3.6.2.1.

Repair work might require making the suppression chamber inoperable. This specification will permit those repairs to be made and at the same time give assurance that the irradiated fuel has an adequate cooling water supply when the suppression chamber must be made inoperable, including draining, in OPERATIONAL CONDITION 4 or 5.

In OPERATIONAL CONDITION 4 and 5 the suppression chamber minimum required water volume is reduced because the reactor coolant is maintained at or below 200°F.+ Since pressure suppression is not required below 212°F, the minimum water volume is based on NPSH, recirculation volume and vortex prevention plus a safety margin for conservatism.

+ See Special Test Exception 3.10.8.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 89 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 31, 1994, and supplemented by letters dated August 29, and October 16, 1995, the Public Service Electric & Gas Company (the licensee) submitted a request for changes to the Hope Creek Generating Station (HCGS), Technical Specifications (TSs). The proposed change to Technical Specification (TS) 3.5.1, "ECCS - Operating," and associated Bases, would establish a new allowed out-of-service time. Action c.2 for TS 3.5.1 allows any one Low Pressure Coolant Injection subsystem, or one Core Spray subsystem, to be inoperable in addition to an inoperable High Pressure Coolant Injection system, for 72 hours. The supplemental letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The HCGS has an Emergency Core Cooling System (ECCS) consisting of (1) one 100% capacity High Pressure Coolant Injection (HPCI) system, (2) four 100% capacity Low Pressure Coolant Injection (LPCI) subsystems, (3) two 100% capacity Core Spray (CS) subsystems, and (4) an Automatic Depressurization System. At the present time, TS 3.5.1 does not address allowable out-of-service (AOT) times for combinations of LPCI and CS subsystems and the HPCI. The licensee has proposed using the guidance of TS 3.5.1 of the NRC Staff's BWR4 Standard Technical Specifications as presented in NUREG-1433, "General Electric Company (GE) Standard Technical Specifications (STS) for Boiling Reactor 4 (BWR4 STS) Revision 0," September 28, 1992, to address AOTs for the HPCI and LPCI/CS subsystems. The licensee has proposed the following:

> "With the HPCI System inoperable and either one LPCI subsystem or one CSS subsystem inoperable, restore the HPCI System to operable status within 72 hours or restore the LPCI Subsystem/CSS Subsystem to operable status within 72 hours. Otherwise, be in HOT SHUTDOWN within the next 12 hours and reduce reactor steam dome pressure to $\leq$ 200 psig in the next 24 hours."

The purpose of HPCI, LPCI and CS is to provide reactor core cooling to cope with a range of pipe breaks that result in a loss-of-coolant accident (LOCA). These components, together with the ADS, make up the Emergency Core Cooling System (ECCS). The ECCS is designed to provide adequate core cooling even in

the event that some of the ECCS components are inoperable. The TS recognizes that some ECCS components may become inoperable and that reactor operation may continue for a specified period of time (the AOT). These AOTs are determined by the relative importance to safety of the various ECCS components (the more important to safety, the shorter the AOT). The AOT presented in TS 3.5.1 of the NRC's STS represents an acceptable AOT considering the relative importance of HPCI, LPCI and CS components and the number of such components in the model reflected in the STS Bases.

The NRC Staff reviewed the design of the HCGS ECCS system in order to determine if it is comparable to the ECCS design which forms the Bases for the BWR4 STS. Based upon our review we found that the BWR4 and HCGS CS systems are comparable in that each contains two 100%-capacity subsystems with one pump per subsystem. The HCGS LPCI, however, contains greater redundancy in that there are four 100%-capacity subsystems (each with one pump) compared to the BWR4 LPCI which has two 100%-capacity subsystems (each with two pumps). Accordingly, the HCGS LPCI has greater remaining capacity, when compared to the BWR4, for inoperability of a LPCI subsystem.

By letter dated August 29, 1995, the licensee provided the following information with regard to Core Damage Frequency (CDF):

- The baseline average CDF at the HCGS is 1.28×10^{-5}/year. If the HPCI system is inoperable for 72 hours, the conditional core damage probability (CCDP) incurred is 8.1×10^{-7}.

- If the HPCI system and the A or B Low Pressure Coolant Injection (LPCI) subsystem are simultaneously inoperable, the CCDP incurred is 9.0×10^{-7}. If the HPCI system is inoperable coincident with an inoperable C or D LPCI subsystem, the CCDP incurred is 8.2×10^{-7}. If the HPCI system is inoperable coincident with any inoperable Core Spray subsystem, the CCDP incurred is 8.1×10^{-7}. Therefore, the worst case is a coincidental outage of the HPCI system and the A or B LPCI subsystem.

- For the worst case, if the proposed Technical Specification configuration were entered, the increase in CCDP would be 9×10^{-8} ($9.0X10^{-7} - 8.1X10^{-7} = 9X10^{-8}$)

Thus, the increase in risk is negligible.

In conclusion, the NRC Staff finds that HCGS and the BWR4 have comparable ECCS redundancy with HCGS having an advantage with regard to LPCI redundancy. In addition, the proposed HPCI and LPCI/CS AOT results in an acceptably low contribution to CDF. Accordingly, the proposed change to HCGS TS 3.5.1 is 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 amendment. The State official had no comments.

4.0 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 (59 FR 29631). 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.

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 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: November 30, 1995