April 3, 1989

Docket No. 50-354

Mr. Steven E. Miltenberger
Vice President and Chief Nuclear
Officer
Public Service Electric & Gas Company
Post Office Box 236
Hancocks Bridge, New Jersey 08038

Dear Mr. Miltenberger

SUBJECT: INCREASE SETPOINTS OF MAIN STEAM LINE RADIATION MONITORS - HYDROGEN WATER CHEMISTRY (TAC NO. 69580)

Re: HOPE CREEK GENERATING STATION

The Commission has issued the enclosed Amendment No. 23 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 September 28, 1988.

This amendment increases the setpoints of the main steam line radiation monitors in the Technical Specifications.

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

Sincerely,

Clyde Shiraki, Project Manager
Project Directorate I-2
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 23 to
License No. NPF-57
2. Safety Evaluation

cc w/enclosures:
See next page

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[MILTEN LETTER]

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

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

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 23
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 September 28, 1988 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. 23, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. PSE&G shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/
Walter R. Butler, 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: April 3, 1989

PDI-2/LA	PDI-2/PM	PDI-2/D	OGC
MO'Brien	CShiraki:tr	WButler	EBachmann
3/17/89	3/17/89	3/31/89	3/22/89

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Walter R. Butler

Walter R. Butler, 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: April 3, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 23

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. Overleaf pages are provided to maintain document completeness.*

Remove	Insert
2-5	2-5
-	-*
3/4 3-15	3/4 3-15*
3/4 3-16	3/4 3-16
3/4 3-25	3/4 3-25
3/4 3-26	3/4 3-26*

TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS
(continued)

FUNCTIONAL UNIT	TRIP SETPOINT	ALLOWABLE VALUES
6. Main Steam Line Radiation - High, High#	$\leq$ 3.0 x full power background	$\leq$ 3.6 x full power background
7. Drywell Pressure - High	$\leq$ 1.68 psig	$\leq$ 1.88 psig
8. Scram Discharge Volume Water Level - High		
a. Float Switch	Elevation 110' 10.5"	Elevation 111' 0.5"
b. Level Transmitter/Trip Unit	Elevation 110' 10.5"*	Elevation 111' 4.5"*
9. Turbine Stop Valve - Closure	$\leq$ 5% closed	$\leq$ 7% closed
10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	$\geq$ 530 psig	$\geq$ 465 psig
11. Reactor Mode Switch Shutdown Position	NA	NA
12. Manual Scram	NA	NA

*80.5" above instrument zero EL 104' 2" for Level Transmitter/Trip Unit A&B (South Header) 83.25" above instrument zero EL 103' 11.25" for Level Transmitter/Trip Unit C&D (North Header)

#The hydrogen water chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, and prior to operating the HWC system, the normal full power background radiation level and associated trip setpoints may be increased to levels previously measured during full power operation with hydrogen injection. Prior to decreasing below 20% of RATED THERMAL POWER and after the HWC system has been shutoff, the background level and associated setpoint shall be returned to the normal full power values. If a power reduction event occurs so that the reactor power is below 20% of RATED THERMAL POWER without the required setpoint change, control rod motion shall be suspended (except for scram or other emergency actions) until the necessary setpoint adjustment is made.

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION	VALVE ACTUATION GROUPS OPERATED BY SIGNAL[d]	MINIMUM OPERABLE CHANNELS PER TRIP SYSTEM[a]	APPLICABLE OPERATIONAL CONDITION	ACTION
7. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION				
a. Reactor Vessel Water Level - Low, Level 3	3	2/Valve[e]	1, 2, 3	27
b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	3	2/Valve[e]	1, 2, 3	27
c. Manual Initiation	3	1/Valve[e]	1, 2, 3	25

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

ACTION

ACTION 20 - Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

ACTION 21 - Be in at least STARTUP with the associated isolation valves closed within 6 hours or be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

ACTION 22 - Be in at least STARTUP within 6 hours.

ACTION 23 - Close the affected system isolation valves within one hour and declare the affected system inoperable.

ACTION 24 - Restore the manual initiation function to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

ACTION 25 - Restore the manual initiation function to OPERABLE status within 8 hours or close the affected system isolation valves within the next hour and declare the affected system inoperable.

ACTION 26 - Establish SECONDARY CONTAINMENT INTEGRITY with the Filtration, Recirculation and Ventilation System (FRVS) operating within one hour.

ACTION 27 - Lock the affected system isolation valves closed within one hour and declare the affected system inoperable.

ACTION 28 - Place the inoperable channel in the tripped condition or close the affected system isolation valves within one hour and declare the affected system inoperable.

ACTION 29 - Place the inoperable channel in the tripped condition or establish SECONDARY CONTAINMENT INTEGRITY with the Filtration, Recirculation, and Ventilation System (FRVS) operating within one hour.

NOTES

* When handling irradiated fuel in the secondary containment and during CORE ALTERATIONS and operations with a potential for draining the reactor vessel.

** When any turbine stop valve is greater than 90% open and/or when the key-locked bypass switch is in the Norm position.

\# Refer to Specification 3.1.5 for applicability.

The hydrogen water chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, and prior to operating the HWC system, the normal full power background radiation level and associated trip setpoints may be increased to levels previously measured during full power operation with hydrogen injection. Prior to decreasing below 20% of RATED THERMAL POWER and after the HWC system has been shutoff, the background level and associated setpoint shall be returned to the normal full power values. If a power reduction event occurs so that the reactor power is below 20% of RATED THERMAL POWER without the required setpoint change, control rod motion shall be suspended (except for scram or other emergency actions) until the necessary setpoint adjustment is made.

(a) A channel may be placed in an inoperable status for up to 2 hours for required surveillance without placing the trip system in the tripped condition provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

(b) Also trips and isolates the mechanical vacuum pumps.

(c) Also starts the Filtration, Recirculation and Ventilation System (FRVS).

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION	TRIP SETPOINT	ALLOWABLE VALUE
7. RHR SYSTEM SHUTDOWN COOLING MODE ISOLATION		
a. Reactor Vessel Water Level - Low, Level 3	$\geq$ 12.5 inches*	$\geq$ 11.0 inches
b. Reactor Vessel (RHR Cut-in Permissive) Pressure - High	$\leq$ 82.0 psig	$\leq$ 102.0 psig
c. Manual Initiation	NA	NA

*See Bases Figure B 3/4 3-1.
**Initial setpoint. Final setpoint to be determined during startup test program.
***These setpoints are as follows:
160°F - RWCU pipe chase room 4402
140°F - RWCU pump room and heat exchanger rooms
135°F - RWCU pipe chase room 4505
#30 minute time delay.
##15 minute time delay.
###The hydrogen water chemistry (HWC) system shall not be placed in service until reactor power reaches 20% of RATED THERMAL POWER. After reaching 20% of RATED THERMAL POWER, and prior to operating the HWC system, the normal full power background radiation level and associated trip setpoints may be increased to levels previously measured during full power operation with hydrogen injection. Prior to decreasing below 20% of RATED THERMAL POWER and after the HWC system has been shutoff, the background level and associated setpoint shall be returned to the normal full power values. If a power reduction event occurs so that the reactor power is below 20% of RATED THERMAL POWER without the required setpoint change, control rod motion shall be suspended (except for scram or other emergency actions) until the necessary setpoint adjustment is made.

TABLE 3.3.2-3

ISOLATION SYSTEM INSTRUMENTATION RESPONSE TIME

TRIP FUNCTION	RESPONSE TIME (Seconds)#
1. PRIMARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level	
1) Low Low, Level 2	NA
2) Low Low Low, Level 1	NA
b. Drywell Pressure - High	NA
c. Reactor Building Exhaust Radiation - High	NA
d. Manual Initiation	NA
2. SECONDARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level-Low Low, Level 2	NA
b. Drywell Pressure - High	NA
c. Refueling Floor Exhaust Radiation - High(b)	$\leq$ 4.0
d. Reactor Building Exhaust Radiation - High(b)	$\leq$ 4.0
e. Manual Initiation	NA
3. MAIN STEAM LINE ISOLATION	
a. Reactor Vessel Water Level - Low Low Low, Level 1	$\leq$ 1.0*/$\leq$ 13(a)**
b. Main Steam Line Radiation - High, High(a)(b)	$\leq$ 1.0*/$\leq$ 13(a)**
c. Main Steam Line Pressure - Low	$\leq$ 1.0*/$\leq$ 13(a)**
d. Main Steam Line Flow-High	$\leq$ 0.5*/$\leq$ 13(a)**
e. Condenser Vacuum - Low	NA
f. Main Steam Line Tunnel Temperature - High	NA
g. Manual Initiation	NA
4. REACTOR WATER CLEANUP SYSTEM ISOLATION	
a. RWCU Δ Flow - High	NA
b. RWCU Δ Flow - High, Timer	NA
c. RWCU Area Temperature - High	NA
d. RWCU Area Ventilation Δ Temperature - High	NA
e. SLCS Initiation	NA
f. Reactor Vessel Water Level - Low Low, Level 2	NA
g. Manual Initiation	NA
5. REACTOR CORE ISOLATION COOLING SYSTEM ISOLATION	
a. RCIC Steam Line Δ Pressure (Flow) - High	NA
b. RCIC Steam Line Δ Pressure (Flow) - High, Timer	NA
c. RCIC Steam Supply Pressure - Low	NA
d. RCIC Turbine Exhaust Diaphragm Pressure - High	NA

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO.23 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 September 28, 1988, the licensee requested to amend Hope Creek Generating Station, Unit 1 Operating License NPF-57 to allow the operation of a permanent hydrogen water chemistry (HWC) system. The amendment proposes revising Technical Specification (TS) Tables 2.2.1-1, 3.3.2-1 and 3.3.2-2 (See attached proposed TS revisions). The TS changes would allow permanent HWC system operation by increasing the Main Steam Line (MSL) Radiation - High full power background radiation level and associated trip points and by restricting HWC operation to power levels greater than 20% of rated thermal power.

2.0 EVALUATION

2.1 MSL Radiation Monitor Set Point Technical Specification (TS) Changes

The MSL radiation monitors provide reactor scram as well as reactor vessel and primary containment isolation signals upon detection of high activity levels in the main steam lines. Additionally, these monitors serve to limit radioactivity released in the event of fuel failures. The proposed TS would replace the footnote approved by issuance of Amendment 8 (restrictions associated with the hydrogen injection test) with the restrictions associated with the installation of a permanent HWC system. The MSL radiation monitor setpoint will be adjusted upward only when the HWC system is operated at above 20% of rated thermal power. The setpoint adjustment will be based on radiation levels previously measured during full power operation when testing hydrogen injection. The increased main steam line radiation level results from increased N-16 activity levels in the steam phase due to hydrogen injection. Prior to decreasing below 20% of rated thermal power and after the HWC system has been shutdown, the background level and associated setpoint shall be returned to the normal full power values. Control rod motion shall be suspended should reactor power be below 20% until the required setpoint adjustment is made.

The licensee states that the only accident scenario which takes credit for the MSL high radiation trip is the design basis control rod drop accident (CRDA). Generic analysis of the consequences of a CRDA have shown that fuel failures are not expected from a CRDA occurring at greater than 10% power. This is primarily

a result of analyses which show that as power increases, the severity of the CRDA decreases due to the effects of increased void formation and doppler reactivity feedback. Since hydrogen injection will be limited to above 20% power and the increased MSL radiation monitor trip setpoint will be reduced to normal levels below this power level, the staff concludes that the currently approved CRDA analysis for the Hope Creek plant is appropriately bounded and remains valid. Therefore, the proposed Technical Specification changes are acceptable.

2.2 Radiation Protection

The staff has reviewed the licensee's submittal regarding the radiological implication due to the increased radiation levels associated with increased N-16 activities during hydrogen injections into the reactor coolant system. During the HWC test phase radiation surveys were made at various points inside and outside the plant. Test results showed that at the optimum hydrogen addition rate additional shielding and revised access control procedures were not necessary. In addition, there were no measurable increases in radiation levels at the site boundary. Permanent HWC will be conducted to maintain radiation exposure ALARA in accordance with Regulatory Guide 8.8 and is, therefore, acceptable.

2.3 Hydrogen and Oxygen Storage Facility

The licensee will utilize an interim gaseous hydrogen storage facility until a permanent facility is selected and designed. The interim facility consists of a tube bank of compressed hydrogen gas (total capacity 293,000 scf, each tube capacity 7000 scf, maximum pressure 2450 psig). At Hope Creek, a separate hydrogen storage and distribution system is utilized for main stator cooling purge. It is recommended that the licensee consider connecting the main generator stator cooling purge hydrogen into the HWC system so that all Hope Creek hydrogen usage meets the "Guidelines for Permanent BWR Hydrogen Water Chemistry Installations - 1987 Revision" EPRI NP 5283-SR-A, as is being done at other BWR HWC installations. The separation distance between the hydrogen storage facility and safety related structures meets the recommendations of NFPA 50 A and EPRI NP 5283-SR-A. The 3000 gallon tank of liquid oxygen will be located at least 50 feet from safety-related structures which meets the recommendations of NFPA 50 and EPRI NP 5283-SR-A.

2.4 Hydrogen and Oxygen Injection System

Hydrogen will be injected into the feedwater system on the suction side of the secondary condensate pump at the rate of approximately 18 scfm. Oxygen will be piped to the offgas system upstream of the recombiner for recombination of excess hydrogen. It is also injected into the feedwater system to maintain a 20-60 ppb dissolved oxygen concentration for feedwater piping corrosion control. Hydrogen monitors are located at the condensate booster pump and near the control valves to prevent the accumulation of an explosive mixture. When the hydrogen concentration exceeds 2% an alarm sounds and when it exceeds 4% the hydrogen line is isolated. Excess flow check valves and packless valves for hydrogen service will be used to minimize hydrogen leaks.

2.5 Result of Evaluation

On the basis of the above evaluation, we find that the proposed Technical Specification changes required for implementation of HWC at Hope Creek Nuclear Station, Unit 1 meets the BWR Owners Group "Guidelines for Permanent Hydrogen Water Chemistry Installation - 1987 Revision," and are therefore, acceptable. The staff intends to visit the site after the HWC installation is completed. We plan to review the hydrogen and oxygen storage facilities, hydrogen and oxygen injection systems, instrumentation and controls, and safety considerations to determine consistency with the above guidelines.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 this amendment.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (53 FR 46156) on November 16, 1988 and consulted with the State of New Jersey. No public comments were received and the State of New Jersey did not have any comments.

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: Conrad McCracken and Clyde Shiraki

Dated: April 3, 1989