

November 4, 1997

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. M98309)

Dear Mr. Eliason:

The Commission has issued the enclosed Amendment No. 107 to Facility Operating License No. NPF-57 for the Hope Creek Generating Station (HCGS). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated March 31, 1997, as supplemented by letters dated July 16, August 26, and October 3, 1997.

This amendment changes TS 2.1.2, "THERMAL POWER, High Pressure and High Flow," ACTION a.1.c for TS 3.4.1.1, "Recirculation Loops," and the Bases for TS 2.1, "Safety Limit." These changes are being made to implement an appropriately conservative Safety Limit Minimum Critical Power Ratio, to include Cycle 8 specific analyses, for all HCGS core and fuel designs.

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. 107 to License No. NPF-57
- 2. Safety Evaluation

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

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Sincerely,

A handwritten signature in black ink, appearing to read "D. H. Jaffe".

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. 107 to
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2. Safety Evaluation

cc w/encls: See next page

Mr. Leon R. Eliason
Public Service Electric & Gas
Company

Hope Creek Generating Station

cc:

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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.107
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 31, 1997, as supplemented by letters dated July 16, August 26, and October 3, 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. 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. 107, 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



John F. Stolz, Director
Project Directorate 1-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: November 4, 1997

ATTACHMENT TO LICENSE AMENDMENT NO.107

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

2-1
B 2-1
3/4 4-1
6-21

Insert

2-1
B 2-1
3/4 4-1
6-21

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

2.1 SAFETY LIMITS

THERMAL POWER, Low Pressure or Low Flow

2.1.1 THERMAL POWER shall not exceed 25% of RATED THERMAL POWER with the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With THERMAL POWER exceeding 25% of RATED THERMAL POWER and the reactor vessel steam dome pressure less than 785 psig or core flow less than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

THERMAL POWER, High Pressure and High Flow

2.1.2 The MINIMUM CRITICAL POWER RATIO (MCPR) shall not be less than 1.10 with two recirculation loop operation and shall not be less than 1.12 with single recirculation loop operation, in both cases with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow.*

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With MCPR less than 1.10 with two recirculation loop operation or less than 1.12 with single recirculation loop operation and in both cases with the reactor vessel steam dome pressure greater than 785 psig and core flow greater than 10% of rated flow, be in at least HOT SHUTDOWN within 2 hours and comply with the requirements of Specification 6.7.1.

REACTOR COOLANT SYSTEM PRESSURE

2.1.3 The reactor coolant system pressure, as measured in the reactor vessel steam dome, shall not exceed 1325 psig.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3 and 4.

ACTION:

With the reactor coolant system pressure, as measured in the reactor vessel steam dome, above 1325 psig, be in at least HOT SHUTDOWN with reactor coolant system pressure less than or equal to 1325 psig within 2 hours and comply with the requirements of Specification 6.7.1.

*Values applicable to Cycle 8 operation only.

2.1 SAFETY LIMITS

BASES
=====

2.0 INTRODUCTION

The fuel cladding, reactor pressure vessel and primary system piping are the principal barriers to the release of radioactive materials to the environs. Safety Limits are established to protect the integrity of these barriers during normal plant operations and anticipated transients. The fuel cladding integrity Safety Limit is set such that no fuel damage is calculated to occur if the limit is not violated. Because fuel damage is not directly observable, a step-back approach is used to establish a Safety Limit such that the MCPR is not less than 1.10 for two recirculation loop operation and 1.12 for single recirculation loop operation. MCPR greater than 1.10 for two recirculation loop operation and 1.12 for single recirculation loop operation represents a conservative margin relative to the conditions required to maintain fuel cladding integrity. The fuel cladding is one of the physical barriers which separate the radioactive materials from the environs. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Although some corrosion or use related cracking may occur during the life of the cladding, fission product migration from this source is incrementally cumulative and continuously measurable. Fuel cladding perforations, however, can result from thermal stresses which occur from reactor operation significantly above design conditions and the Limiting Safety System Settings. While fission product migration from cladding perforation is just as measurable as that from use related cracking, the thermally caused cladding perforations signal a threshold beyond which still greater thermal stresses may cause gross rather than incremental cladding deterioration. Therefore, the fuel cladding Safety Limit is defined with a margin to the conditions which would produce onset of transition boiling, MCPR of 1.0. These conditions represent a significant departure from the condition intended by design for planned operation.

2.1.1 THERMAL POWER, Low Pressure or Low Flow

The use of the applicable NRC-approved critical power correlation is not valid for all critical power calculations performed at reduced pressures below 785 psig or core flows less than 10% of rated flow. Therefore, the fuel cladding integrity Safety Limit is established by other means. This is done by establishing a limiting condition on core THERMAL POWER with the following basis. Since the pressure drop in the bypass region is essentially all elevation head, the core pressure drop at low power and flows will always be greater than 4.5 psi. Analyses show that with a bundle flow of 28×10^3 lbs/hr, bundle pressure drop is nearly independent of bundle power and has a value of 3.5 psi. Thus, the bundle flow with a 4.5 psi driving head will be greater than 28×10^3 lbs/hr. Full scale ATLAS test data taken at pressures from 14.7 psia to 800 psia indicate that the fuel assembly critical power at this flow is approximately 3.35 Mwt. With the design peaking factors, this corresponds to a THERMAL POWER of more than 50% of RATED THERMAL POWER. Thus, a THERMAL POWER limit of 25% of RATED THERMAL POWER for reactor pressure below 785 psig is conservative.

3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 RECIRCULATION SYSTEM

RECIRCULATION LOOPS

LIMITING CONDITION FOR OPERATION

=====

3.4.1.1 Two reactor coolant system recirculation loops shall be in operation with:

- a. Total core flow greater than or equal to 45% of rated core flow, or
- b. THERMAL POWER less than or equal to the limit specified in Figure 3.4.1.1-1.

APPLICABILITY: OPERATIONAL CONDITIONS 1* and 2*.

ACTION:

- a. With one reactor coolant system recirculation loop not in operation:
 1. Within 4 hours:
 - a) Place the recirculation flow control system in the Local Manual mode, and
 - b) Reduce THERMAL POWER to $\leq 70\%$ of RATED THERMAL POWER, and
 - c) Increase the MINIMUM CRITICAL POWER RATIO (MCPR) Safety Limit per Specification 2.1.2, and
 - d) Reduce the Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) limit to a value of 0.86 times the two recirculation loop limit per Specification 3.2.1, and
 - e) DELETED.
 - f) Limit the speed of the operating recirculation pump to less than or equal to 90% of rated pump speed, and
 - g) Perform surveillance requirement 4.4.1.1.2 if THERMAL POWER is $\leq 38\%$ of RATED THERMAL POWER or the recirculation loop flow in the operating loop is $\leq 50\%$ of rated loop flow.
 2. Within 4 hours, reduce the Average Power Range Monitor (APRM) Scram Trip Setpoints and Allowable Values to those applicable for single recirculation loop operation per Specifications 2.2.1 and 3.2.2; otherwise, with the Trip Setpoints and Allowable Values associated with one trip system not reduced to those applicable for single recirculation loop operation, place the affected trip system in the tripped condition and within the following 6 hours, reduce the Trip Setpoints and Allowable Values of the affected channels to those applicable for single recirculation loop operation per Specifications 2.2.1 and 3.2.2.
 3. Within 4 hours, reduce the APRM Control Rod Block Trip

*See Special Test Exception 3.10.4.

ADMINISTRATIVE CONTROLS

CORE OPERATING LIMITS REPORT (Continued)

The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by NRC in NEDE-24011-P-A (the latest approved revision)*, General Electric Standard Application for Reactor Fuel (GESTAR II).

The core operating limits shall be determined so that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, and transient and accident analysis limits) of the safety analysis are met.

The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, DC 20555, with a copy to the USNRC Administrator, Region 1, within the time period specified for each report.

6.9.3 Violations of the requirements of the fire protection program described in the Final Safety Analysis Report which would have adversely affected the ability to achieve and maintain safe shutdown in the event of a fire shall be submitted to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, DC 20555, with a copy to the USNRC Administrator, Region 1, via the Licensee Event Report System within 30 days.

6.10 RECORD RETENTION

6.10.1 In addition to the applicable record retention requirements of Title 10, Code of Federal Regulations, the following records shall be retained for at least the minimum period indicated.

SPECIAL REPORTS

6.10.2 The following records shall be retained for at least 5 years:

- a. Records and logs of unit operation covering time interval at each power level.
- b. Records and logs of principal maintenance activities, inspections, repair, and replacement of principal items of equipment related to nuclear safety.
- c. All REPORTABLE EVENTS submitted to the Commission.
- d. Records of surveillance activities, inspections, and calibrations required by these Technical Specifications.
- e. Records of changes made to the procedures required by Specification 6.8.1.
- f. Records of radioactive shipments.
- g. Records of sealed source and fission detector leak tests and results.

*For Cycle 8, as evaluated in the Safety Evaluation dated 11/4/97 to support License Amendment No. 107 .



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 107 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, 1997, as supplemented by letters dated July 16, August 26, and October 3, 1997, the Public Service Electric & Gas Company (the licensee) submitted a request for changes to the Hope Creek Generating Station, Technical Specifications (TSs). The requested amendment would change TS 2.1.2, "THERMAL POWER, High Pressure and High Flow," ACTION a.1.c for TS 3.4.1.1, "Recirculation Loops," and the Bases for TS 2.1, "Safety Limits." These changes are being made to implement an appropriately conservative Safety Limit Minimum Critical Power Ratio (SLMCPR), to include Cycle 8 specific analyses, for all Hope Creek core and fuel designs. The August 26 and October 3, 1997, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The licensee requested a change to the Hope Creek TS for Cycle 7 and Cycle 8 operation. The proposed revisions to the TS are evaluated herein.

- (1) The SLMCPR in TS 2.1.2 and Bases 2.0 is proposed to change as follows: for two recirculation loop operation - from 1.07 to 1.08 for Cycle 7 and from 1.07 to 1.10 for Cycle 8; and for single recirculation loop operation - from 1.08 to 1.09 for Cycle 7 and from 1.08 to 1.12 for Cycle 8 when the reactor steam dome pressure is ≥ 785 psig and core flow $\geq 10\%$ rated core flow.

The NRC staff has reviewed the proposed changes to TS 2.1.2 and Bases 2.0, which are based on the analyses performed using Hope Creek cycle-specific inputs and approved methodologies including GESTAR II (NEDE-24011-P-A-13, Sections 1.1.5 and 1.2.5 and its reference NEDO-10958-A, January 1977), the relevant information related to the need for cycle-specific analysis for each reload and the assumptions used in performing cycle-specific analysis of GE fuel, which was provided in the proposed Amendment 25 to GESTAR II, NEDE-24011 (which is under the staff review) and the licensee's response to the request for additional information dated August 26, 1997. Both Cycle 7 and 8 cores have a full core of GE9B fuel, however, the Cycle 8 has a higher SLMCPR than

that of Cycle 7 due to its higher MCPR importance factors and maximum radial peaking factors. The core MCPR distribution and bundle R-factor distributions are also evaluated for non-equilibrium Cycle 7 and 8 core compared with that of the generic GE9B equilibrium core to ensure that 99.9% fuel rods in the core will not experience the boiling transition. Therefore, the staff has found the proposed TS changes are acceptable.

- (2) The value of the SLMCPR, for single recirculation loop operation, in Action Statement a.1.c of TS 3.4.1.1 is proposed to be deleted.

Since the revision to the SLMCPR in TS 2.1.2 contains the appropriate SLMCPR for single loop operation, this value need not be repeated in TS 3.4.1.1. Accordingly, the proposed deletion of the value of the SLMCPR in Action Statement a.1.c of TS 3.4.1.1 is acceptable.

The October 3, 1997, letter proposed an additional change to TS 2.1.2. This change would add a footnote indicating that the values for SLMCPR are "...applicable to Cycle 8 operation only." This footnote is consistent with the analyses and is acceptable. The second change would add a footnote to TS 6.9.1.9, "Core Operating Limits Report," to indicate that relevant information from proposed Amendment No. 25 to GESTAR II (NEDE-24011) was reviewed in this safety evaluation for Cycle 8. This change will ensure that values for cycle-specific parameters will be determined such that all applicable limits (e.g., nuclear limits, transient limits, and accident analysis limits) are met. Therefore, this change is acceptable.

Based on our review above, we conclude that the proposed changes to the TS are acceptable for Hope Creek Cycle 8 application since the changes are analyzed based on the NRC-approved method and the conservative cycle-specific parameters for SLMCPR analysis are used. Since Hope Creek was shut down for refueling at the time of issuance of this license amendment, and will operate for Cycle 8 upon restart, only the Cycle 8 values for SLMCPR are incorporated in the TS.

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. By letter dated May 6, 1997, the State official indicated that there were 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 (62 FR 43374). The amendment also changes reporting or recordkeeping requirements. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (c)(10). 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: T. Huang

Date: November 4, 1997