50-354

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

April 19, 1999

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, ULTIMATE HEAT SINK TEMPERATURE LIMITS (TAC NO. MA2060)

Dear Mr. Keiser:

The Commission has issued the enclosed Amendment No.120 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 June 12, 1998, as supplemented July 23, 1998, and September 8, 1998.

The amendment revises TS Limiting Condition for Operation Sections 3.7.1.1, 3.7.1.2, and 3.7.1.3. Specifically, the changes revise the Ultimate Heat Sink (UHS) limits for river water temperature, in order to increase operational flexibility. In addition, the Station Service Water System (SSWS) and Safety Auxiliaries Cooling System (SACS) TS Action Statements have been revised to provide additional restrictions on continued plant operation. These revisions provide more explicit TS direction for plant operation under limiting SSWS/SACS configurations.

Although your application, dated June 12, 1998, did not specify a requested completion date for the Nuclear Regulatory Commission (NRC) review, Public Service Electric and Gas Company (PSE&G) did request that the NRC provide prompt review "to support plant operation during the upcoming period of elevated water temperature." This application was not submitted in a timely manner taking into consideration that the seasonal river water temperatures could have caused limitations on plant operation prior to NRC issuance of an amendment. In fact, river water temperature approached the existing UHS TS limits in late July 1998, and PSE&G held discussions with NRC staff concerning possible licensing actions to prevent plant shutdown (e.g., Notice of Enforcement Discretion or emergency TS change).

In addition, your application for this amendment was not technically complete and, as a result, it required significant clarifications including a public meeting and requests for additional information after the initial submittal.

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

Sincerely,

RB Ennis

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

cc w/encls: See next page

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:

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. 120 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

PUBLIC SERVICE ELECTRIC & GAS COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-354

HOPE CREEK GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 120
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 June 12, 1998, as supplemented July 23, 1998, and September 8, 1998, 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. 120 , 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, to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

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 19, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 120

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 7-1a	3/4 7-1a
3/4 7-3	3/4 7-3
3/4 7-5	3/4 7-5

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

3. a. With one SACS pump in each subsystem inoperable, and if continued plant operation is permitted by LCO 3.7.1.3, restore at least one inoperable pump 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 one SACS heat exchanger in each subsystem inoperable, immediately initiate measures to place the unit in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4. With both SACS subsystems otherwise inoperable, immediately initiate measures to place the unit in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN* in the following 24 hours.

b. In OPERATIONAL CONDITION 3 or 4 with the SACS subsystem, which is associated with an RHR loop required OPERABLE by Specification 3.4.9.1 or 3.4.9.2, having two SACS pumps or one heat exchanger inoperable, declare the associated RHR loop inoperable and take the ACTION required by Specification 3.4.9.1 or 3.4.9.2, as applicable.

---

* Whenever both SACS 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.

*** Two diesel generators and service water pumps associated with the required OPERABLE SACS pumps and all SACS heat exchangers must be OPERABLE.

PLANT SYSTEMS
STATION SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least the following independent station service water system loops, with each loop comprised of:

a. Two OPERABLE station service water pumps, and
b. An OPERABLE flow path capable of taking suction from the Delaware River (ultimate heat sink) and transferring the water to the SACS heat exchangers,

shall be OPERABLE:

a. In OPERATIONAL CONDITION 1, 2 and 3, two loops.
b. In OPERATIONAL CONDITION 4, 5 and *, one loop.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, 5 and *.

ACTION:

a. In OPERATIONAL CONDITION 1, 2, or 3:

1. With one station service water pump inoperable, and if continued plant operation is permitted by LCO 3.7.1.3, restore the inoperable pump to OPERABLE status within 30 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.** If the condition specified by ** can not be met, be in at least HOT SHUTDOWN within the next 72 hours and in COLD SHUTDOWN within the following 24 hours.

2. With one station service water pump in each loop inoperable, and if continued plant operation is permitted by LCO 3.7.1.3, restore at least one inoperable pump 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.***

3. With one station service water system loop otherwise inoperable, and if continued plant operation is permitted by LCO 3.7.1.3, assess operability of the associated SACS loop and take the ACTION specified in LCO 3.7.1.1, Action Statement a.2, if required, and restore the inoperable station service water system loop to OPERABLE status with at least one OPERABLE pump within 72 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.**

* When handling irradiated fuel in the secondary containment.
** Two diesel generators and two SACS pumps associated with the unaffected service water loop must be OPERABLE.
*** Two diesel generators and SACS pumps associated with the required OPERABLE service water pumps and all SACS heat exchangers must be OPERABLE.

PLANT SYSTEMS
ULTIMATE HEAT SINK

LIMITING CONDITION FOR OPERATION

3.7.1.3 The ultimate heat sink (Delaware River) shall be OPERABLE with:

a. A minimum river water level at or above elevation -9'0 Mean Sea Level, USGS datum (80'0 PSE&G datum), and

b. An average river water temperature of less than or equal to 85.0°F.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, 3, 4, 5 and *.

ACTION:

With the river water temperature in excess of 85.0°F, continued plant operation is permitted provided that both emergency overboard discharge valves are open and emergency discharge pathways are available. With the river water temperature in excess of 88.0°F, continued plant operation is permitted provided that all of the following additional conditions are satisfied: ultimate heat sink temperature is at or below 89.0°F, all SSWS pumps are OPERABLE, all SACS pumps are OPERABLE, all EDGs are OPERABLE and the SACS loops have no cross-connected loads (unless they are automatically isolated during a LOP and/or LOCA); otherwise, with the requirements of the above specification not satisfied:

a. In OPERATIONAL CONDITIONS 1, 2 or 3, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. In OPERATIONAL CONDITIONS 4 or 5, declare the SACS system and the station service water system inoperable and take the ACTION required by Specification 3.7.1.1 and 3.7.1.2.

c. In Operational Condition *, declare the plant service water system inoperable and take the ACTION required by Specification 3.7.1.2. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.1.3 The ultimate heat sink shall be determined OPERABLE:

a. By verifying the river water level to be greater than or equal to the minimum limit at least once per 24 hours.

b. By verifying river water temperature to be within its limit:

1) at least once per 24 hours when the river water temperature is less than or equal to 82°F.
2) at least once per 2 hours when the river water temperature is greater than 82°F.

* When handling irradiated fuel in the secondary containment.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO.120 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 June 12, 1998, as supplemented July 23, 1998, and September 8, 1998, and a public meeting on July 29, 1998, the Public Service Electric & Gas Company (the licensee) requested changes to the Hope Creek Generating Station (HCGS) Technical Specifications (TSs). The requested changes would revise TS Limiting Condition for Operation (LCO) Sections 3.7.1.1, 3.7.1.2, and 3.7.1.3. These changes would revise the Ultimate Heat Sink (UHS) limits for river water temperature, in order to increase operational flexibility. In addition, the Station Service Water System (SSWS) and Safety Auxiliaries Cooling System (SACS) TS Action Statements would be revised to provide additional restrictions on continued plant operation. These proposed revisions would provide more explicit TS direction for plant operation under limiting SSWS/SACS configurations. The July 23, 1998, and September 8, 1998, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The SSWS is described in Section 9.2.1 of the HCGS Updated Final Safety Analysis Report (UFSAR). The SSWS provides cooling water from the Delaware River (which serves as the ultimate heat sink) to the SACS heat exchangers and the Reactor Auxiliary Cooling Systems (RACS) heat exchangers (HXs) during normal operating conditions and loss of offsite power (LOP) conditions. The SACS provides cooling to engineered safety features (ESF) equipment, while the RACS only cools nonessential loads. During a loss-of-coolant accident (LOCA) and other design basis accidents (DBAs), the SSWS provides cooling water only to the SACS heat exchangers. The RACS heat exchangers are isolated from the SSWS in the event of a LOCA.

The SSWS consists of two redundant loops. Each loop is equipped with two pumps in parallel. During normal operation, two SSWS pumps, one in each loop, are operating. Each of the SSWS loops cools a separate SACS loop. The two SSWS loops are normally aligned to supply the two RACS heat exchangers through a common supply header. Normally, the effluent from the heat exchangers discharges through a common, non-Seismic Category I

header located outside of the Reactor Building. Water from the header discharges to the cooling tower discharge canal before discharging to the UHS. In the event this normal flow path is unavailable, water is discharged directly to the plant yard via the Seismic Category I emergency overboard (EOB) lines.

As described in UFSAR Section 9.2.2, the Safety and Turbine Auxiliaries Cooling System (STACS) is a closed loop cooling water system consisting of two subsystems: SACS, which is safety-related, and the Turbine Auxiliaries Cooling System (TACS), which is non-safety-related. The TACS is automatically isolated in the event of a LOP, LOCA, or large TACS leakage. The SACS, which consists of two redundant loops, is designed to provide cooling water to the ESF equipment, including the residual heat removal heat exchanger, during normal operation (which includes plant shutdown), LOP, and LOCA, and to the TACS heat exchangers during normal operation. Each SACS loop is equipped with two 50-percent capacity pumps and two 50-percent capacity heat exchangers in parallel. The SACS heat exchanger outlet temperature is currently restricted to temperatures between 32°F and 95°F. The SSWS and SACS are designed such that a single active failure will not cause a total loss of functional capability for either loop of the SSWS or the SACS. Similarly, a single passive failure will not cause the loss of both loops of the SSWS or SACS. The licensee states in the UFSAR that the plant may be safely shut down under emergency conditions with an average river temperature as high as 89.9°F. Temperature sensors are located at the discharge of each service water pump strainer. These temperatures are indicated in the main control room, from which the temperatures are averaged for the TS river water / UHS temperature.

Since 1990, HCGS has been evaluating the appropriate UHS temperature. In licensee event report (LER) 90-014 dated September 12, 1990, the licensee reported that the TS operability temperature for the UHS was not conservative. The licensee determined that the analysis did not provide allowances for SSWS pump degradation. As a result, the licensee lowered the UHS TS LCO temperature from 90.5°F to 88.6°F. This was approved by Amendment 68 to the license. In LER 96-015 dated May 10, 1996, the licensee reported that following a loss of the normal (non-safety-related) discharge pathway, the flow through the EOB lines, which is the safety-related discharge path, was insufficient to maintain the SACS heat exchanger outlet temperature below 95°F during certain design basis conditions. As a result, the licensee lowered the UHS TS LCO from 88.6°F to 85°F and allowed continued operation up to 87°F provided both the emergency discharge valves are open, the emergency discharge pathways are available, all SSWS pumps are operable, all SACS pumps are operable, all emergency diesel generators (EDGs) are operable and the SACS loops have no cross-connected loads (unless they are automatically isolated during a LOP and/or LOCA). This was approved as Amendment 106 to the license. The licensee has continued to evaluate the UHS temperature due to seasonal high river temperatures that could exceed the 87°F TS Action Statement temperature limit.

As discussed in HCGS UFSAR Section 3.1.2.4.15, the SSWS and SACS meet the requirements of 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 44. This GDC requires that a system be provided to transfer heat from structures, systems, and components important to safety to an ultimate heat sink. GDC 44 also requires that suitable redundancy in components and features be provided to assure the system safety function can be

accomplished, assuming a single failure.

3.0 EVALUATION

3.1 Evaluation of Proposed Changes Effect on Plant Systems and Equipment

3.1.1 TS 3.7.1.3 Changes

The UHS LCO 3.7.1.3 Action Statement is being modified to incorporate new plant operating restrictions and new river water temperature limitations. Currently the HCGS LCO Action Statement states:

> With the river water temperature in excess of 85.0°F, continued plant operation is permitted provided that all of the following conditions are satisfied: ultimate heat sink temperature is below 87°F, both emergency overboard discharge valves are open and emergency discharge pathways are available, all SSWS pumps are OPERABLE, all SACS pumps are OPERABLE, all EDGs are OPERABLE and the SACS loops have no cross-connected loads (unless they are automatically isolated during a LOP and/or LOCA); otherwise, with the requirements of the above specification not satisfied:

The proposed revision of the LCO 3.7.1.3 Action Statement would state:

> With the river water temperature in excess of 85.0°F, continued plant operation is permitted provided that both emergency overboard discharge valves are open and emergency discharge pathways are available.
>
> With the river water temperature in excess of 88.0°F, continued plant operation is permitted provided that all of the following additional conditions are satisfied: ultimate heat sink temperature is at or below 89.0°F, all SSWS pumps are OPERABLE, all SACS pumps are OPERABLE, all EDGs are OPERABLE and the SACS loops have no cross-connected loads (unless they are automatically isolated during a LOP and/or LOCA); otherwise, with the requirements of the above specification not satisfied:

The licensee performed temperature/flow calculations for the SSWS and SACS to demonstrate that higher UHS temperatures could adequately remove the safety-related heat loads. The limiting safety-related component for UHS temperature is the SACS heat exchanger. The licensee evaluated the effects of raising the SACS heat exchanger outlet temperature from 95°F to 100°F to determine if the safety-related heat loads would be adequately transferred to the UHS.

3.1.1.1 Systems Evaluation

During normal operation the SACS heat exchanger outlet temperature is restricted to 95°F. With the SACS heat exchanger outlet temperature at 95°F, the maximum UHS temperature is 89.1°F. The licensee identified another limiting configuration during operation. If HCGS is operating in the TS allowed outage time (AOT) configuration of one SACS pump operating per

loop, then the maximum UHS sink temperature that provides adequate cooling is 88°F.

The licensee evaluated the UHS temperature using a SACS heat exchanger outlet temperature of 100°F for accident scenarios. The licensee determined that the limiting accident scenario was a LOP with a safe shutdown earthquake (SSE) and performed several calculations using different system configurations with this accident scenario to determine the limiting UHS temperature. The calculations assumed the SACS heat exchanger had a discharge temperature of 100°F and the following assumptions:

- minimum river water level
- flow is through the EOB discharge pathway
- all SSWS operating at minimum IST performance
- SSWS strainers are 75% clogged
- SSWS/SACS heat exchangers are fouled in accordance with design basis conditions
- maximum SACS heat loads
- maximum SACS flow rate

The licensee calculated the limiting UHS temperature for various limiting accident configurations. The table below provides the results for accident and normal operating conditions with the current UHS temperatures (with the SACS heat exchanger outlet temperature at 95°F) and the proposed changes for the UHS temperature (with the SACS heat exchanger outlet temperature at 100°F).

Operating Condition	**Current UHS Temperature Limit**	**Licensee's Re-evaluated UHS Temperature**	**Current / Proposed SACS Heat Exchanger Outlet Temperature**
LOP/SSE - (1 EOB failure)	85°F	86.6°F	95°F / 100°F
LOP/SSE - (1 SSWS pump per loop)	85°F	88.2°F	95°F / 100°F
LOP/SSE - (No failures)	87°F	91.1°F	95°F / 100°F
LOP/SSE - (1 SSWS loop out)	87°F	89.8°F	95°F / 100°F
AOT - (1 SACS pump per loop)	88°F	not changed	95°F / 95°F
Normal Operation	89.1°F	not changed	95°F / 95°F

The most limiting UHS temperature without equipment restrictions is 86.6°F. This UHS temperature limit is due to a LOP/SSE with the failure of one EOB line. The licensee proposes

to maintain the TS 3.7.1.3 Action Statement requirement for temperatures over 85°F provided that the EOB discharge valves and breakers are opened and the emergency discharge pathways are available. Because of this operating condition, HCGS would not be vulnerable to this configuration and therefore it would not be an UHS operating restriction.

The licensee also identified two other scenarios or configurations that without equipment restrictions would limit the UHS temperature. These are: (1) a LOP/SSE with one SSWS pump per loop operating and (2) a design basis failure concurrent with a system configuration allowed by the TS AOT of one SACS pump per loop and two SACS heat exchangers per loop during normal operation. The maximum allowed UHS temperature in these configurations would be 88.2°F and 88°F, respectively. The licensee proposes to allow operation above 88°F provided the following conditions are satisfied: all SSWS pumps are operable, all SACS pumps are operable, all EDGs are operable and the SACS loops have no cross-connected loads (unless they are automatically isolated during a LOP and/or LOCA). With these operational conditions, HCGS would not be able to operate in these two scenarios or configurations. Therefore, they would not be limiting for the UHS temperature.

In the evaluation at the higher SACS heat exchanger outlet temperature, two of the accident scenario and system configurations that were limiting are now above the proposed operating limit. The scenarios are: (1) a LOP/SSE with no failures and (2) a LOP/SSE with one SSWS loop out of service. In these scenarios the UHS temperature limits are 91.1°F and 89.8°F, respectively, which are greater than the proposed operating condition of 89°F. Therefore, they would not be UHS operating restrictions.

The next limiting UHS temperature is the result of normal operation. The licensee concluded that the UHS temperature limit must be at or below 89.1°F to maintain the SACS heat exchanger outlet temperature at or below 95°F. The licensee proposes to prohibit operation over 89°F; therefore, this temperature limit will ensure that the SACS heat exchanger outlet temperature can remain below 95°F during normal operation.

The licensee proposed that an UHS temperature of 89°F be the maximum temperature for operation, provided that above 85°F both EOB discharge valves are open and emergency discharge pathways are available, and above 88°F the additional restrictions apply: the UHS temperature is at or less than 89°F, all SSWS pumps are operable, all SAC pumps are operable, all EDGs are operable, and the SACS loops have no cross-connected loads (unless they are automatically isolated during a LOP and/or a LOCA). The staff reviewed the licensee's assumptions and inputs for the analysis. The analysis method used is the same analysis method used in Amendment 106. The staff finds that the analysis assumptions and inputs are appropriate. Based on the evaluation of the normal operation configurations and limiting accident scenario configurations, the staff finds the systems evaluation to be acceptable.

3.1.1.2 Equipment Evaluation

In Attachment 4 to the submittal of June 12, 1998, the licensee provided an analysis (Engineering Evaluation Report No. H-1-EG-MEE-1301) to demonstrate that the effects of

raising the temperature limit of the water leaving the SACS heat exchangers from 95°F to 100°F, for safety-related and other important components and equipment, is acceptable.

Coolers, Chillers, and Filtration, Recirculation, and Ventilation System (FRVS):

With respect to coolers, chillers, and FRVS units, the evaluation includes the following components that are cooled by the SACS: EDG coolers, EDG room cooler, RHR pump seal cooler, residual heat removal (RHR) pump motor bearing cooler, emergency core cooling system (ECCS) and reactor core isolation cooling (RCIC) pump room cooler, post accident sampling system cooler, control room chiller, Class 1E Panel chiller, and FRVS.

The results of the analysis show that the heat load requirements for each of the above components are satisfied, that some adjustments on temperature setpoints and operating procedures are recommended, and that the design criteria (such as cooler process side fluid temperatures, room temperatures, equipment qualification temperatures) for each of the above components are maintained. The following are the recommended adjustments as documented in Attachment 4 to the licensee's submittal dated June 12, 1998:

1. A control room chilled water temperature limit setpoint of 48.5°F + 0.5°F/-0.0°F is recommended.

2. A Class 1E Panel (Technical Support Center) chilled water temperature limit setpoint of 47°F ± 0.5°F is recommended.

3. The EDG room coolers should be throttled to 25% open during a SACS loop outage with 2 EDGs cross-tied.

4. Keep safety-related accumulators on the control room and Class 1E panel chilled water flow control valves operable throughout the year. The accumulators are currently only required during periods of river water temperature less than 70°F.

5. Raise the redundant ECCS room cooler setpoints to 122.7°F ± 2.3°F.

Based on the review of the licensee's analysis, the staff concurs with the licensee that the effect of raising the temperature limit of the water leaving the SACS heat exchangers from 95°F to 100°F is acceptable. The above recommendations on setpoints and procedure adjustment should be properly implemented.

Spent Fuel Pool Cooling System and Turbine Auxiliaries Cooling System:

The licensee reviewed the use of the spent fuel pool cooling system and TACS when the SACS heat exchanger outlet temperature would be higher than 95°F. The TACS components automatically isolate following a LOCA, LOP, or detection of large TACS leakage. The spent fuel pool pumps automatically trip following a LOP and can be manually tripped following a LOCA to ensure adequate cooling to the safety-related equipment. Since these systems are automatically isolated or can be manually isolated, the licensee did not evaluate the effects of

the higher SACS temperature. The current abnormal operating procedures for the spent fuel pool allows the heat exchanger to be isolated for up to 24 hours. The pool alarm setpoint is at 130°F and the procedures direct operators to re-establish cooling to the spent fuel pool. The staff finds that these current procedures adequately preclude the pool temperature from rising above 150°F for long periods of time. The staff concurs with the licensee's conclusion that the operating conditions for these systems have not been changed as a result of this proposed amendment.

3.1.2 TS 3.7.1.1 and TS 3.7.1.2 Changes

The licensee proposes to revise TS 3.7.1.1 and TS 3.7.1.2 Action Statements to provide guidance on SACS heat exchanger operability for continued plant operation. In TS 3.7.1.1, Action Statement a.3.a, the licensee proposes to require that all SACS heat exchangers are operable during the one SACS pump per loop configuration in addition to the two diesel generators and SSWS pumps associated with the operable SACS pump. In TS 3.7.1.2, Action Statement a.3, the licensee proposes to require that all SACS heat exchangers are operable during the one SSWS pump per loop configuration in addition to the two diesel generators and SACS pumps associated with the operable SSWS pump. The staff finds the proposed revisions to TS 3.7.1.1 and TS 3.7.1.2 Action Statements are more restrictive than current requirements and are acceptable.

3.2 Evaluation of Proposed Changes Effect on Containment Analyses

The staff reviewed the effect on the HCGS containment analyses due to the proposed change to TS 3.7.1.3 (i.e., UHS maximum temperature limit change from 87°F to 89°F) and the associated change in SACS heat exchanger outlet temperature during accident conditions from 95°F to 100°F.

The licensee performed a containment analysis evaluation to determine the required RHR heat exchanger K-value (heat transfer capacity coefficient) to keep the peak suppression pool temperature below the present design limit of 212°F after a limiting LOP event or LOCA if the SACS water temperature is increased from 95°F to 100°F. The initial temperature of the suppression pool will be maintained at 95°F or below in accordance with the HCGS TSs. This assumes that the SACS water temperature will also be maintained at 95°F or below during normal operation.

The licensee's evaluation takes advantage of the extra heat capacity of the RHR heat exchanger. The limiting case was determined to be the LOP scenario in which aligning the RHR heat exchanger to shutdown cooling could not be accomplished. In this scenario, the RHR heat exchanger remains aligned to suppression pool cooling. For this case, suppression pool cooling is assumed to be initiated after 30 minutes following the LOP event compared to 10 minutes following a LOCA (i.e., the delay in suppression pool cooling for the LOP case causes the suppression pool to reach a higher temperature than in the LOCA scenario). The General Electric (GE) SHEX computer code was used to calculate the containment response. The licensee indicated that the analysis used the May-Witt decay heat model to calculate the containment response. The staff finds the use of GE SHEX computer code for the above

evaluation to determine the required RHR heat exchanger K-value acceptable.

The analysis calculated the required RHR K-value to be 307 Btu/sec-°F for the SACS water temperature of 100°F to keep the suppression pool temperature below 212°F after the limiting LOP event. The licensee performed an evaluation of the RHR heat exchanger with maximum fouled conditions and determined that the RHR heat exchanger has the required K- value with the proposed SACS water temperature and required flow rate through the RHR heat exchanger to keep the suppression pool temperature below the present design limit of 212°F.

Based on the above, the staff concludes that the proposed change to the Action Statement of LCO 3.7.1.3 to limit the ultimate heat sink temperature to 89°F is acceptable as it does not affect the containment response of maximum suppression pool design temperature of 212°F following an accident.

3.3 Evaluation of Proposed Changes Effect on Suppression Pool Temperature

For HCGS, the worst case accident for the maximum suppression pool temperature is a loss of offsite power coincident with a single failure of an emergency diesel generator. The licensee stated that with the worst case accident and the river water temperature at 89°F, the maximum calculated suppression pool temperature would be maintained to temperatures below the design limit of 212°F. At 212°F, HCGS has sufficient net positive suction head for all their safety-related ECCS and containment heat removal pumps. On this basis, the staff concludes that the changes, described above, to the Action Statement of LCO 3.7.1.3 are acceptable.

3.4 Evaluation of Proposed Changes Effect on Operator Actions

The staff used the following guidance on manual operator actions and the time required to perform those actions to complete its evaluation of the licensee's submittals dated June 12 and July 23, 1998: Generic Letter (GL) 91-18, "Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability (1991)," and American National Standards Institute/American Nuclear Society (ANSI/ANS)-58.8, "Time Response Design Criteria for Safety-Related Operator Actions (1984)."

GL 91-18 states, "The consideration of manual action in...areas also must include the ability and timing in getting to the area, training of personnel to accomplish the task, and occupational hazards to be incurred such as radiation, temperature, chemical, sound, or visibility hazards." ANSI/ANS-58.8 provides guidance on estimating response times for operator actions and allows licensees to use time intervals derived from independent sources, provided they are based on task analyses or empirical data.

Following the licensee's initial submittal letter of June 12, 1998, the NRC staff requested additional information in a letter dated July 17, 1998. The licensee responded to the NRC staff's questions in a supplement dated July 23, 1998. A public meeting was held on July 29, 1998, as documented by the NRC in a meeting summary dated August 18, 1998. Additional questions raised during the meeting were addressed in a supplement from the licensee dated

September 8, 1998. The NRC staff evaluated the licensee's initial submittal and the two supplements with respect to new operator actions, reduced operator actions, training, and procedural guidance, as detailed below.

1. Discuss any new operator actions that would be required as a result of the technical specification amendment request.

The licensee stated that no new operator actions are required in either normal plant operation or post-transient situations.

2. State the operator actions that are no longer required and discuss specifically what the engineering analyses indicated.

The licensee stated that isolating/throttling of the flow of the RACS under LOP conditions will no longer be required because revised engineering analyses have supported the removal of this post-transient operator action. The licensee explained that the engineering analyses of SSWS/SACS performance were made with the SSWS to RACS supply valves in their post-LOP position (that is, no operator actions to throttle flow). The licensee noted that in this configuration adequate flow is provided to the SACS heat exchangers to support the proposed TS amendment.

The licensee also stated that HCGS's current SSWS abnormal operating procedure addresses a condition in which a LOP and/or a loss-of-coolant accident occurs coincident with the following: (1) an event that results in blockage of the normal flow path to the cooling tower, (2) the emergency overboard discharge valves are open, and (3) the SACS heat exchanger outlet temperatures cannot be maintained below 95°F. Under the previously discussed conditions, operators are currently required to complete the following actions: (1) if all four SSWS pumps are running, isolate the SSWS outlet from one of the SSWS/SACS heat exchangers in the SSWS/SACS loop not servicing RHR decay heat loads or (2) when only two SSWS pumps are operating in one loop and one SSWS pump is operating in the other, ensure that the SSWS outlet from one of the SSWS/SACS heat exchangers in the loop with only one SSWS pump in service not servicing RHR decay heat loads is closed. The licensee stated that these operator actions are no longer necessary in response to the previously discussed conditions because revised engineering analyses have ensured that sufficient flow to the SSWS/SACS heat exchangers will be available such that heat removal requirements are satisfied for the proposed TS river water temperature limits.

3. Describe specific operator training that may be needed regarding the TS amendment request.

The licensee reiterated that operator actions will be reduced in post-transient situations. Further, the licensee stated that (1) the normal procedure revision process would be used to implement the changes that reduce the required operator actions and (2) recurring training will continue to be used to evaluate the effectiveness of operator response to design-basis accident and transient conditions.

4. Describe the schedule for procedural revisions related to the TS amendment request.

The licensee stated that procedural revisions would be completed within the 60-day period that has been requested for implementation of the TS amendment.

5. Explain how the operator accomplishes the following (Action Statement a.3 of TS 3.7.1.2): "Assess operability of the associated SACS loop..."

The licensee stated that GL 91-18 discusses the need to evaluate a system's operability when its support system is declared inoperable. Further, the licensee noted that if an SSWS loop is declared inoperable, the current SSWS abnormal procedure directs the operator to assess the operability of the associated SACS loop (i.e., by ensuring that a pump is operable and flow is established and determining the SACS support system's capability, that is, the SSWS capability to support the SACS safety functions under design basis conditions). If SSWS can not support the SACS safety functions, then SACS is also declared inoperable and the appropriate SACS TS LCO would be entered. The licensee stated that no changes are needed to the existing procedure to implement the proposed changes to TS 3.7.1.2 (that is, SSWS LCO Action Statement a.3).

The staff finds that the previously discussed information is consistent with ANSI/ANS-58.8 and GL 91-18 and therefore, is acceptable. The staff concludes that the licensee's responses related to the proposed TS changes, which require a reduction in operator actions, are acceptable.

3.5 Summary

Based on the above evaluation, the staff finds the proposed revisions to TS LCO sections 3.7.1.1, 3.7.1.2, and 3.7.1.3 to be acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersy 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 (63 FR 35995). 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.

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