PSE&G

Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038-0236

Nuclear Business Unit

DEC 27 1999

LR-N99514
LCR H99-11

United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Gentlemen:

**REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
CHANGES TO RHR SYSTEM FLOW SURVEILLANCES IN
SUPPRESSION POOL COOLING AND SPRAY MODES
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354**

In accordance with 10CFR50.90, Public Service Electric & Gas (PSE&G) Company hereby requests a revision to the Technical Specifications (TS) for the Hope Creek Generating Station (HC). In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

Implementation of the proposed changes contained in this submittal will establish more appropriate surveillance test acceptance criteria for the Residual Heat Removal (RHR) System in the Suppression Pool Spray and Suppression Pool Cooling modes of RHR operations. Specifically, Surveillance Requirements 4.6.2.2.b and 4.6.2.3.b will establish flow rate acceptance criteria that reflect design basis parameters for RHR in these specific modes of operation.

The proposed changes have been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and a determination has been made that this request involves no significant hazards considerations. The basis for the requested change is provided in Attachment 1 to this letter. A 10CFR50.92 evaluation, with a determination of no significant hazards consideration, is provided in Attachment 2. The marked-up Technical Specification pages affected by the proposed changes are provided in Attachment 3.

Upon NRC approval of this proposed change, PSE&G requests that the amendment be made effective on the date of issuance, but allow an implementation period of sixty days to provide sufficient time for associated administrative activities.

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Should you have any questions regarding this request, please contact Mr. James Priest at 856-339-5434.

Sincerely,

M. J. Trum
Vice President - Maintenance

Affidavit
Attachments (3)

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STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

M. J. Trum, being duly sworn according to law deposes and says:

I am Vice President – Maintenance of Public Service Electric and Gas Company, and as such, I find the matters set forth in the above referenced letter, concerning Hope Creek Generating Station, Unit 1, are true to the best of my knowledge, information and belief.

Subscribed and Sworn to before me
this 27 day of December, 1999

Elizabeth J. Kidd
Notary Public of New Jersey

ELIZABETH J. KIDD
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires April 25, 2000

My Commission expires on _____

HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354
REVISIONS TO THE TECHNICAL SPECIFICATIONS (TS)

BASIS FOR REQUESTED CHANGE:

Public Service Electric and Gas Company (PSE&G), under Facility Operating License No. NPF-57 for the Hope Creek Generating Station, requests that the TS contained in Appendix A to the Operating License be amended as proposed herein to revise TS Surveillance Requirements 4.6.2.2.b and 4.6.2.3.b. The proposed changes would revise references to the Residual Heat Removal (RHR) heat exchanger bypass valves from the acceptance criteria contained in the subject surveillance requirements such that the flow rate acceptance criteria are based solely upon flow through the RHR heat exchanger. PSE&G has concluded that the existing surveillance requirements contain acceptance criteria that do not adequately demonstrate design basis parameters related to either the Suppression Pool Spray or Suppression Pool Cooling modes of RHR operation. Using the Corrective Action Program, PSE&G has implemented administrative controls for RHR surveillance testing that will continue to appropriately maintain RHR operability while the changes proposed in this submittal are reviewed by the NRC.

REQUESTED CHANGE, PURPOSE AND BACKGROUND:

The TS changes associated with this request are contained in Attachment 3. The proposed changes affect TS Surveillance Requirements 4.6.2.2.b and 4.6.2.3.b. The changes revise the term "its associated closed bypass valve" from the surveillance test requirements that demonstrate RHR flow in either the Suppression Pool Spray or Suppression Pool Cooling modes of operation to "after consideration of flow through the closed bypass valve". These changes are necessary since Hope Creek's current containment heat removal design basis calculations assume that all of the flow specified in each surveillance test (i.e., 500 gpm for Suppression Pool Spray and 10,000 for Suppression Pool Cooling) is through the RHR heat exchanger. In addition, the surveillance acceptance criteria are revised to account for instrument uncertainty associated with the RHR flow rate parameter. Although RHR pump performance can accommodate RHR heat exchanger bypass valve leakage, the surveillance requirements need to be revised to either: 1) increase the flow rate acceptance criteria to account for RHR heat exchanger bypass valve leakage; or 2) maintain the flow rate

acceptance criteria, specifying that the flow is through the heat exchanger. In this submittal, PSE&G is proposing that the latter option be implemented for RHR testing.

The current surveillance test criteria were established by Hope Creek TS Amendment No. 94, with an associated SER dated February 26, 1996. The purpose for the revisions implemented by the February 26, 1996, amendment was to provide a TS surveillance requirement that permits the RHR line flow acceptance criteria to account for leakage in the RHR heat exchanger bypass valves. The justification for these changes relied, in part, on: 1) containment heat removal analyses, which determined that only 8985 gpm of RHR flow is required through the heat exchanger to provide for adequate containment heat removal; and 2) and periodic verification of actual heat exchanger flow rates.

Since the issuance of TS Amendment No. 94, PSE&G has re-evaluated containment heat removal requirements in order to optimize Ultimate Heat Sink (UHS) temperature limits at Hope Creek. The resultant analyses, which were used to support the UHS temperature limits established via Hope Creek TS Amendment No. 120, utilized a flow rate of 10,000 gpm through the RHR heat exchanger while RHR was in the Suppression Pool Cooling mode of operation following design basis accident conditions. Subsequently, PSE&G has determined that, although RHR has been continually capable of performing its design basis safety-related functions, the TS and TS Bases changes proposed in Attachment 3 of this submittal are required to appropriately reflect design basis parameters of system performance. As described in the following section, these changes: 1) reflect current design basis calculations for containment heat removal requirements; 2) account for instrument uncertainty within the surveillance acceptance criteria; 3) establish a fixed system resistance limit which can be used to evaluate RHR pump degradation; and 4) maintain the appropriate level of control over the performance of these RHR surveillances.

JUSTIFICATION OF REQUESTED CHANGES:

As described in Section 5.4.7 of the Hope Creek UFSAR, the RHR System contains two loops ("A" and "B") with heat exchangers designed to maintain containment temperatures following post design basis accident and transient scenarios. To control containment temperatures, the RHR System can be operated in the Suppression Pool Cooling mode and/or the Suppression Pool Spray mode. While operating in these modes, RHR transfers the containment heat load to the Safety Auxiliaries Cooling System (SACS) via the RHR heat exchangers. The design of the "A" and "B" RHR loops also includes RHR heat exchanger bypass lines, which currently utilize a

"butterfly" control valve (1BCHV-F048A(B)) to control flow through the RHR heat exchangers.

The Hope Creek analyses of design-basis accidents assume specific containment heat removal rates in order to maintain containment temperatures under the given design basis conditions. The current analysis (Engineering Evaluation H-1-EG-MEE-1301), which was used to determine the Ultimate Heat Sink temperature limits approved by the NRC in Hope Creek TS Amendment No. 120, assumes that RHR flow through the heat exchanger is at a rate of 10,000 gpm while in the Suppression Pool Cooling mode. The RHR flow rate described in the SER for Hope Creek TS Amendment No. 94 does not reflect the current design basis assumptions for SACS and RHR flow rates and temperatures, and therefore, the proposed changes to the Suppression Pool Cooling Surveillance Requirement 4.6.2.3.b will more consistently and accurately reflect the design basis assumptions of RHR performance while in this mode of operation and will establish appropriate acceptance criteria. The proposed Surveillance Requirement 4.6.2.2.b and 4.6.2.3.b acceptance criteria account for instrument uncertainty associated with the RHR flow rate parameter (170 gpm for Suppression Pool Cooling and 20 gpm for Suppression Pool Spray).

In addition, the bases for TS Surveillance Requirements 4.6.2.2.b and 4.6.2.3.b state that these tests are performed to ensure adequate pump performance during the operating cycle and to trend performance between tests (consistent with NUREG-1433). The manner in which the surveillance test acceptance criteria is currently established provides no fixed limit on system resistance levels (which would vary depending on bypass valve leakage rates), and therefore does not enable successful trending of pump performance data. To enable improved pump performance trending, a maximum acceptable leakage quantity (which provides a minimum acceptable system resistance) will be established for the heat exchanger bypass valve. Hydraulic analyses have demonstrated that total pump flow rates are not changed significantly (<20 gpm) when tested with bypass valve leakage values of zero and 250 gpm (i.e., when the bypass valve leakage is held to this level, the total system resistance does not change appreciably). Therefore, by establishing a maximum 250 gpm leakage rate for the heat exchanger bypass valves (which will be incorporated into the TS Bases), a constant system resistance would be accounted for in the pump test required by Surveillance Requirement 4.6.2.3.b. For Surveillance Requirement 4.6.2.2.b, the RHR heat exchanger bypass valve leakage rate has a negligible impact on the ability to achieve 500 gpm in the Suppression Pool Spray mode of operation, and therefore, will not be accounted for in the test procedure acceptance criteria.

Furthermore, by limiting bypass valve leakage to 250 gpm in the TS Bases to maintain constant system resistance for the RHR pump test, a limit on bypass valve degradation is also established. Since implementation of HC TS Amendment No. 94, PSE&G has periodically measured the RHR heat exchanger bypass valve leakage to ensure that the required flow rate through the RHR heat exchanger can be achieved during the Suppression Pool Cooling mode of operation, and thus account for bypass valve degradation. PSE&G will continue to measure bypass valve leakage.

In summary, the proposed TS surveillances will establish testing requirements that have acceptance criteria reflective of analytical limits contained in Hope Creek's design basis. The proposed TS Bases associated with these surveillance requirements will provide appropriate control over the surveillance test results to account for: 1) the manner in which the pump flow rates are measured; 2) heat exchanger bypass valve leakage; and 3) associated test instrument uncertainty. PSE&G will continue to utilize the provisions of 10CFR50.59 to evaluate changes made to the testing limits established in the TS Bases.

PSE&G believes that the proposed changes to the TS: 1) are consistent with Hope Creek's design basis analysis limits; 2) provide a test methodology that will more effectively trend RHR pump performance; and 3) maintain appropriate control over system configuration within the TS and associated Bases.

ENVIRONMENTAL IMPACT:

The proposed TS changes were reviewed against the criteria of 10CFR51.22 for environmental considerations. The proposed changes do not involve a significant hazards consideration, a significant increase in the amounts of effluents that may be released offsite, or a significant increase in the individual or cumulative occupational radiation exposures. Based on the foregoing, PSE&G concludes that the proposed TS changes meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirements for an Environmental Impact Statement.

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10CFR50.92 EVALUATION

Public Service Electric & Gas (PSE&G) has concluded that the proposed changes to the Hope Creek Generating Station (HC) Technical Specifications do not involve a significant hazards consideration. In support of this determination, an evaluation of each of the three standards set forth in 10CFR50.92 is provided below.

REQUESTED CHANGE

The proposed changes affect TS Surveillance Requirements 4.6.2.2.b and 4.6.2.3.b. The changes revise the term "its associated closed bypass valve" from the surveillance test requirements that demonstrate Residual Heat Removal (RHR) flow in either the Suppression Pool Spray or Suppression Pool Cooling modes of operation. These changes are necessary since Hope Creek's current containment heat removal design basis calculations assume that all of the flow specified in each surveillance test (i.e., 500 gpm for Suppression Pool Spray and 10,000 for Suppression Pool Cooling) is through the RHR heat exchanger. In addition, the surveillance acceptance criteria are revised to account for instrument uncertainty associated with the RHR flow rate parameter.

BASIS

1. *The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The proposed TS change does not involve any physical changes to plant structures, systems or components (SSC). The RHR system will continue to function as designed. The RHR system is designed to mitigate the consequences of an accident, and therefore, can not contribute to the initiation of any accident. The proposed TS surveillance requirement changes implement testing methods that more appropriately control and reflect RHR operation and establish acceptance criteria, which ensure that Hope Creek's licensing and design basis assumptions are met. In addition, this proposed TS change will not increase the probability of occurrence of a malfunction of any

plant equipment important to safety, since the manner in which the RHR system is operated is not affected by these proposed changes. The proposed surveillance requirement acceptance criteria ensure that the RHR safety functions will be accomplished. Therefore, the proposed TS changes would not result in the increase of the consequences of an accident previously evaluated, nor do they involve an increase in the probability of an accident previously evaluated.

2. *The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The proposed TS changes do not involve any physical changes to the design of any plant SSC. The design and operation of the RHR system is not changed from that currently described in Hope Creek's licensing basis. The RHR system will continue to function as designed to mitigate the consequences of an accident. Implementing the proposed changes does not result in plant operation in a configuration that would create a different type of malfunction to the RHR system than any previously evaluated. In addition, the proposed TS changes do not alter the conclusions described in Hope Creek's licensing basis regarding the safety related functions of this system.

Therefore, the proposed TS change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. *The proposed change does not involve a significant reduction in a margin of safety.*

The proposed changes contained in this submittal would implement testing methods that adequately demonstrate RHR pump capability and establish acceptance criteria consistent with Hope Creek's licensing basis. The ability of RHR to perform its safety functions is not adversely affected by these proposed changes. Therefore, the proposed TS change does not involve a significant reduction in a margin of safety.

CONCLUSION

Based on the above, PSE&G has determined that the proposed changes do not involve a significant hazards consideration.

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TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating License No. NPF-57 are affected by this change request:

Technical Specification	Page
4.6.2.2.b	3/4 6-15
4.6.2.3.b	3/4 6-16
B3/4.6.2	B 3/4 6-4

CONTAINMENT SYSTEMS

SUPPRESSION POOL SPRAY

LIMITING CONDITION FOR OPERATION

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

a. One OPERABLE RHR pump, and

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

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

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

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

SURVEILLANCE REQUIREMENTS

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

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

b. By verifying that each of the required RHR pumps develops a flow of at least ~~600~~ 520 gpm on recirculation flow through the RHR heat exchanger, ~~its associated closed bypass valve,~~ and suppression pool spray sparger when tested pursuant to Specification 4.0.5.

(after consideration of flow through the closed bypass valve)

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

CONTAINMENT SYSTEMS

SUPPRESSION POOL COOLING

LIMITING CONDITION FOR OPERATION

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

a. One OPERABLE RHR pump, and

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

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

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

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

SURVEILLANCE REQUIREMENTS

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

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

b. By verifying that each of the required RHR pumps develops a flow of at least ~~10,000~~ 10,170 gpm on recirculation flow through the RHR heat exchanger, ~~its associated closed bypass valve,~~ and the suppression pool when tested pursuant to Specification 4.0.5.

(after consideration of flow through the closed bypassed valve)

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

DEPRESSURIZATION SYSTEMS (Continued)

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

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

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

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

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

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

INSERT A

To provide for consistent pump performance data, during the SPC surveillance test the RHR test return valve (HV-F024A(B)) is fully opened and an upper limit of 250 gpm for heat exchanger bypass valve leakage is established in the surveillance procedure acceptance criteria. By establishing a maximum 250 gpm leakage rate for the heat exchanger bypass valves and opening the test return valve fully, a constant system resistance is established for every pump test required by Surveillance Requirement 4.6.2.3.b. RHR pump degradation would then be more readily detectable if the total flow decreased between tests. In addition, instrument uncertainty is accounted for by applying a flow penalty of 170 gpm to the acceptance criteria in the SPC surveillance. Since the flow rate for this surveillance test is measured downstream of the combined RHR heat exchanger and heat exchanger bypass flow paths, the surveillance procedure acceptance criteria specifies a minimum RHR pump flow rate of 10,420 gpm. For SPS, the ability to provide the required flow is independent of the heat exchanger bypass valve leakage rates because the flow to the SPS header branches far downstream of the heat exchanger and represents only a small percentage (<5%) of the total flow. However, to account for instrument uncertainty, a flow penalty of 20 gpm is applied to the acceptance criteria in the SPS surveillance.

INSERT A

To provide for consistent pump performance data, during the SPC surveillance test the RHR test return valve (HV-F024A(B)) is fully opened and an upper limit of 250 gpm for heat exchanger bypass valve leakage is established in the surveillance procedure acceptance criteria. By establishing a maximum 250 gpm leakage rate for the heat exchanger bypass valves and opening the test return valve fully, a constant system resistance is established for every pump test required by Surveillance Requirement 4.6.2.3.b. RHR pump degradation would then be more readily detectable if the total flow decreased between tests. In addition, instrument uncertainty is accounted for by applying a flow penalty of 170 gpm to the acceptance criteria in the SPC surveillance. Since the flow rate for this surveillance test is measured downstream of the combined RHR heat exchanger and heat exchanger bypass flow paths, the surveillance procedure acceptance criteria specifies a minimum RHR pump flow rate of 10,420 gpm. For SPS, the ability to provide the required flow is independent of the heat exchanger bypass valve leakage rates because the flow to the SPS header branches far downstream of the heat exchanger and represents only a small percentage (<5%) of the total flow. However, to account for instrument uncertainty, a flow penalty of 20 gpm is applied to the acceptance criteria in the SPS surveillance.