



JUL 18 2006

LR-N06-0259

LCR H05-12

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

**SUPPLEMENT TO REQUEST FOR LICENSE AMENDMENT  
ULTIMATE HEAT SINK  
HOPE CREEK GENERATING STATION  
FACILITY OPERATING LICENSE NO. NPF-57  
DOCKET NO. 50-354**

- Reference: 1. LR-N05-0402, "Request for Change to Technical Specifications:  
Ultimate Heat Sink," dated August 4, 2005
2. LR-N06-0031, "Supplement to Request for License Amendment:  
Ultimate Heat Sink," dated February 9, 2006

This letter provides an updated request for license amendment, replacing the information provided in References 1 and 2. PSEG Nuclear LLC (PSEG) requests a change to the Technical Specifications (TS) for the Hope Creek Generating Station to allow a 24-hour average temperature to be used if ultimate heat sink (UHS) temperature exceeds 89 degrees F, provided the UHS temperature does not exceed 91.4 degrees F. The use of the 24-hour average temperature is consistent with NRC-approved Technical Specification Task Force traveler TSTF-330.

The proposed TS changes in this supplement are more restrictive than the changes proposed in Reference 1. The proposed UHS temperature TS limit is reduced from 89.5 to 89 degrees F, unchanged from the current TS limit. The proposed maximum allowable UHS temperature is reduced from 95 to 91.4 degrees F. In accordance with 10 CFR 50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

The revised request is provided in Attachment 1 to this letter. There are no changes to the conclusions of the 10CFR50.92 no significant hazards analysis previously

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submitted. Revised marked up Technical Specification pages are provided in Attachment 2.

PSEG requests approval of the proposed change by August 23, 2006 with implementation to be completed within 60 days of issuance

There are no regulatory commitments contained within this letter.

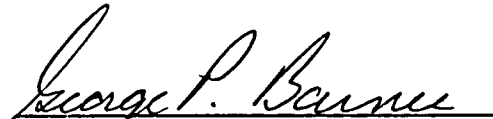
If you have any questions or require additional information, please contact Mr. Paul Duke at (856) 339-1466.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on

7/18/06

(date)

  
George P. Barnes  
Site Vice President - Hope Creek

Attachments (2)

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**REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS  
ULTIMATE HEAT SINK**

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**1. DESCRIPTION**

This letter is a request to amend Operating License NPF-57 for the Hope Creek Generating Station. The proposed change will revise TS 3.7.1.3, "Ultimate Heat Sink" to allow a 24-hour average temperature to be used if ultimate heat sink (UHS) temperature exceeds 89°F, provided the UHS temperature does not exceed 91.4°F.

**2. PROPOSED CHANGE**

The proposed change will revise TS 3.7.1.3, "Ultimate Heat Sink" to allow operation in excess of 89°F if all of the following criteria are met:

- 24-hour average temperature of the river water is less than or equal to 89°F
- Instantaneous river water temperature is less than or equal to 91.4°F.

The proposed change is consistent with TSTF-330, "Allowed Outage Time - Ultimate Heat Sink" and NUREG-1433 "Standard Technical Specifications General Electric Plants BWR/4." In References 1 and 2, the NRC approved similar changes for Millstone Nuclear Power Station, Unit No. 2, and for Peach Bottom Atomic Power Station, Units 2 and 3.

**3. BACKGROUND**

During the summer of 2005, the UHS temperature for Hope Creek approached the 89°F temperature limit in the Technical Specifications (TS). A shutdown of the unit due to UHS high temperature would result in an unnecessary plant transient, and increase the possibility of a disturbance to the offsite electrical power sources and the regional electrical power distribution system at a time of potential grid vulnerability due to maximum generation requirements. This TS change is being proposed in anticipation of future potentially hot, dry periods encountered during the summer.

The UHS for Hope Creek is the Delaware River. The Station Service Water System (SSWS) is a safety related, open loop system, which provides cooling water to safety related heat exchangers and non-safety related heat exchangers during normal operating conditions and loss of offsite power (LOP). During a loss of coolant accident (LOCA) and other design basis accidents (DBA), the SSWS provides river water to cool only the safety related heat exchangers.

The Safety and Turbine Auxiliaries Cooling System (STACS) is a closed loop cooling water system consisting of two subsystems: a Safety Auxiliaries Cooling System (SACS) and a Turbine Auxiliaries Cooling System (TACS). The heat from both systems is transferred to the SSWS via the SACS heat exchangers. The non-safety related TACS portion of the system is isolated following a LOP and/or LOCA scenario.

SACS provides cooling water to the engineered safety features (ESF) equipment, including the residual heat removal (RHR) heat exchanger, during normal operation, normal plant shutdown, LOP, and LOCA conditions. TACS is designed to provide cooling water to the turbine auxiliary equipment during normal plant operation and normal plant shutdown.

The temperature readings that are used to satisfy the UHS temperature limits are normally based on the in-service SSWS pumps' discharge temperatures. The two principal safety functions of the UHS are the dissipation of residual heat after reactor shutdown, and dissipation of residual heat after an accident. The UHS temperature limit is established such that design basis temperatures of safety related equipment would not be exceeded. The basis for the proposed change is consistent with Amendment 120 to the Hope Creek Technical Specification and the NRC issued SER (ref. TAC MA2060).

#### **4. TECHNICAL ANALYSIS**

The proposed TS change maintains the current TS limit on river water temperature, but changes the licensing basis to allow for temporary fluctuations in temperature provided that the average over the previous 24-hour period does not exceed 89°F and the UHS temperature does not exceed 91.4°F. This change does not alter any assumptions on which the current plant safety analysis is based. The affected components were originally designed with margin that allows for cooling water temperatures greater than the current TS temperature limit of 89°F. In determining the capability of the affected heat exchangers, the original equipment design conservatively assumed a certain degree of degradation (i.e., component biofouling or tube plugging). Periodic testing and cleaning are performed to verify that these design conditions assumed for the affected components are not reached.

Where components rely upon UHS temperature to maintain the components within operating temperature limits, engineering evaluations determined that the components could withstand service water temperatures up to 91.4°F. The following component design limits were reviewed:

- Traveling Water Screens
- Spray Wash Booster Pumps
- Service Water Pumps
- Service Water Pump Lubrication
- Service Water Strainers
- SACS Heat Exchangers
- RACS Heat Exchangers
- ESF components cooled by SACS during accident/transient conditions

The current UHS design analysis demonstrates that the maximum allowable UHS temperature to maintain the SACS header below its design basis temperature of 100°F

for the limiting design basis event (loss of offsite power (LOP) coincident with a safe shutdown earthquake (SSE)) is 91.4°F.

TSTF-330 revision 3 provides the following criteria as the basis for adopting the UHS temperature averaging approach:

- A) The UHS is not relied upon for immediate heat removal (such as to prevent containment over pressurization), but is relied upon for longer term cooling such that the averaging approach continues to satisfy the accident analysis assumptions for heat removal over time.

**Response:** The UHS is not immediately relied upon to provide post-accident primary containment heat removal. The suppression pool serves that function and its initial temperature is independent of UHS temperature.

Long-term heat removal is achieved through the use of the containment spray and/or suppression pool cooling modes of the RHR system. The design basis heat removal capability of the RHR heat exchangers, assumed in accident analyses, has been evaluated and is maintained for continuous UHS temperatures up to 91.4°F.

The EDGs rely on the UHS (via SACS) to immediately remove heat from the engine cylinder jackets, turbocharger, combustion air, generator outboard bearings, speed governor oil, and the lubricating oil. As discussed above, the SACS heat exchanger outlet temperature is maintained below the design basis transient/accident limit of 100°F when UHS temperature is less than or equal to 91.4°F.

The drywell coolers are non-safety related and, therefore, are not relied upon in the plant safety analysis for post accident heat removal.

- B) When the UHS is at the proposed maximum allowed value of [91.4°F], equipment that is relied upon for accident mitigation, anticipated operational occurrences or for safe shutdown, will not be adversely affected and are not placed in alarm condition or limited in any way at this higher temperature.

**Response:** The equipment, previously listed, that is relied upon for accident mitigation, anticipated operational occurrences, or for safe shutdown remains capable of performing its design basis function at UHS temperatures up to 91.4°F.

- C) Plant specific assumptions, such as those that were credited in addressing station black out and Generic Letter 96-06 have been adjusted as necessary to be consistent with the maximum allowed UHS temperature of [91.4°F] that is proposed.

**Response:** A review of the Generic Letter (GL) 96-06 evaluations has determined that the evaluations are not impacted by the proposed UHS temperature limit. The impact of the increased UHS temperature limit on events that the plant must be designed to withstand is encompassed by the previous evaluations which demonstrate that the safety related equipment which relies on the UHS for cooling remains capable of performing its design basis function at UHS temperatures up to 91.4°F. Therefore, plant specific assumptions previously credited in evaluating events and regulatory issues are not impacted by the increase in the UHS temperature limit.

- D) Cooling water that is being discharged from the plant (either during normal plant operation, or during accident conditions), does not affect the UHS intake temperature (typical of an infinite heat sink), but location of the intake and discharge connections, and characteristics of the UHS can have an impact.

**Response:** The UHS for Hope Creek is the Delaware River. Between the months of June and August, Hope Creek is required to limit temperature rise in the river to 1.5°F at the end of the mixing zone. Hope Creek is designed such that there is separation between the intake and outtake of the Salem and Hope Creek Stations. Specifically, the mixing zone is 2500 feet up river, 2500 feet down river and 1500 feet offshore. The Hope Creek service water intake structure is about 1500 feet south of the cooling tower discharge pipe or outfall. As noted in the NRC's Final Environmental Statement (FES) for the Hope Creek Operating License (Reference 7), the large tidal influence dilutes, mixes, and rapidly dissipates the thermal discharges from Hope Creek. During an accident, the unit would shut down and the heat input from the circulating water system would be greatly reduced.

## 5. REGULATORY SAFETY ANALYSIS

### 5.1 No Significant Hazards Consideration

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The ultimate heat sink (UHS) is not an accident initiator. An increase in UHS temperature will not increase the probability of occurrence of an accident. The proposed change will allow plant operation to continue if temperature of the UHS exceeds 89°F provided that UHS temperature averaged over the previous 24-hour period is less than or equal to 89°F and the UHS temperature does not exceed 91.4°F. Maintaining the UHS temperature less than or equal to 91.4°F ensures that accident mitigation equipment will continue to perform its required function, thereby ensuring the consequences of accidents previously evaluated are not increased.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change will not install any new or different equipment or modify equipment in the plant. The proposed change will not alter the operation or function of structures, systems or components. The response of the plant and the operators following a design basis accident is unaffected by this change. The proposed change does not introduce any new failure modes and the design basis heat removal capability of the safety related components is maintained at the increased UHS temperature limit.

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

3. Does the proposed change involve a significant reduction in the margin of safety?

Response: No

The increase to the UHS temperature will not adversely affect design basis accident mitigation equipment. The heat removal capability of the UHS is within



the current analyzed limits for UHS temperatures less than or equal to 91.4°F, the proposed maximum allowable temperature. Accident mitigation equipment will continue to function as assumed in the accident analysis. Therefore, the proposed change does not involve a significant reduction in the margin of safety.

## 5.2 Applicable Regulatory Requirements/Criteria

Hope Creek complies with Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants," Revision 2, as described in UFSAR Section 1.8.1.27. The proposed change maintains this compliance.

In conclusion, based on the considerations discussed above in evaluating the proposed change per 10CFR50.91 and 10CFR50.92:

- 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 Commissions' regulations; and
- 3) Issuance of the amendment will not be inimical to the common defense and security or the health and safety of the public.

## 6. ENVIRONMENTAL CONSIDERATIONS

PSEG has determined the proposed amendment relates to changes in a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or relates to changes in an inspection or a surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released off site, or (iii) a significant increase in individual or cumulative occupational exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22 (c) (9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed change is not required.

## 7. REFERENCES

1. Millstone Nuclear Power Station, Unit No.2 - Issuance of Amendment Re: Ultimate Heat Sink Action Requirements (TAC No. MB0867)
2. Peach Bottom Atomic Power Station, Units 2 and 3 - Issuance of Amendment Re: Heat Sink Temperature Limits (TAC Nos. MB4624 and MB4625)

3. NUREG-1433 "Standard Technical Specifications General Electric Plants BWR/4"
4. Safety Evaluation Report for Amendment 120 to Hope Creek Technical Specifications (TAC No. MA2060)
5. TSTF-330 "Ultimate Heat Sink"
6. Regulatory Guide 1.27 "Ultimate Heat Sink for Nuclear Power Plants," Revision 2.
7. NUREG-1074, "Final Environmental Statement Related to the Operation of the Hope Creek Generating Station," December 1984

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

**TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES**

The following Technical Specifications for Facility Operating License NPF-57 are affected by this change request:

<u>Technical Specification</u>	<u>Page</u>
3/4.7.1.3	3/4 7-5

## PLANT SYSTEMS

### ULTIMATE HEAT SINK

#### LIMITING CONDITION FOR OPERATION

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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 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:

INSERT A

- 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

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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 recently irradiated fuel in the secondary containment.

**Insert A**

with ultimate heat sink temperature greater than 89°F and less than or equal to 91.4°F, verify once per hour that water temperature of the ultimate heat sink is less than or equal to 89°F averaged over the previous 24 hour period;