PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

AUG 1 0 2001

PSEG
Nuclear LLC

LRN-01-0247
LCR H00-07

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

Gentlemen:

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
OSCILLATION POWER RANGE MONITOR (OPRM)
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

By letter dated July 12, 2001, the NRC requested additional information to support the staff's review of the request for license amendment submitted by PSEG Nuclear LLC on November 29, 2000 to enable the OPRM trip function. PSEG Nuclear's response is provided in Attachment 1.

In a telephone conversation conducted on July 23, 2001, the NRC staff identified two additional areas that required clarification. The additional information is provided in Attachment 2.

Should you have any questions regarding this information, please contact Mr. Paul Duke at (856) 339-1466.

Sincerely,

D. Garchow
Vice President - Operations

Affidavit
Attachments (2)

A001

C Mr. H. J. Miller, Administrator - Region I
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REF: LRN-01-0247
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STATE OF NEW JERSEY)
) SS.
COUNTY OF SALEM)

David F. Garchow, being duly sworn according to law deposes and says:

I am Vice President – Operations of PSEG Nuclear LLC, 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.

David F. Garchow

Subscribed and Sworn to before me
this 10 day of August, 2001

Constance B. Quather
Notary Public of New Jersey

My Commission expires on CONSTANCE B. QUATHER
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Apr. 25, 2005

ATTACHMENT 1
HOPE CREEK GENERATING STATION UNIT NO. 1
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
OSCILLATION POWER RANGE MONITOR (OPRM)

By letter dated July 12, 2001, the NRC requested additional information to support the staff's review of the request for license amendment submitted by PSEG Nuclear LLC on November 29, 2000 to enable the OPRM trip function. This attachment contains PSEG Nuclear's response.

NRC Question:

1. In order to ensure that the proposed OPRM trip will perform its intended design function, the equipment should be qualified for all environmental conditions where it is installed as required by General Design Criteria (GDC) 4 of Appendix A to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50).

   Therefore, please confirm that the OPRM equipment at HCGS has been qualified for electromagnetic interference (EMI) and radio frequency interference (RFI) based on either the worst-case EMI/RFI levels at its installed location, or by using the generic levels identified by EPRI TR-102323 and Regulatory Guide 1.180.

PSEG Nuclear response:

The OPRM equipment has been qualified for electromagnetic interference (EMI) and radio frequency interference (RFI) susceptibility based on the generic levels identified by EPRI TR-102323 revision 1. The equipment was designed and tested to meet the requirements of MIL-STD-461C. These tests met the frequency limits in the EMI susceptibility guide (EPRI TR-102323, revision 1, Appendix B) with the exception of the radiated susceptibility (RS03) test which was conducted over the range from 14 kHz to 1 GHz in accordance with MIL-STD 461C. The range specified in the EMI susceptibility guide is slightly wider (10 kHz to 1 GHz). The difference is considered negligible for the OPRM equipment based on the small magnitude of the difference, the OPRM equipment's construction in a metal enclosure, and the fact that strong sources of magnetic fields are largely absent from the area in which the OPRM is installed.

ATTACHMENT 2
HOPE CREEK GENERATING STATION UNIT NO. 1
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
OSCILLATION POWER RANGE MONITOR (OPRM)

In a telephone conversation conducted on July 23, 2001, the NRC staff identified two additional areas that required clarification to support the staff's review of the request for license amendment submitted by PSEG Nuclear LLC on November 29, 2000 to enable the OPRM trip function. This attachment contains a restatement of the NRC's questions and PSEG Nuclear's response.

NRC Question:

1. The submittal proposes to delete text in Technical Specifications (TSs) 3.4.1.1, 3.4.1.1.b, 3.4.1.1.c, and 3.1.1.4.d; Surveillance Requirements (SRs) 4.1.1.1.d, 4.1.1.4; and Bases 3/4.4.1. These changes relate to current restrictions on operation related to the power/flow map shown in TS Figure 3.4.1.1.1. Proposed Surveillance Requirement (SR) 4.3.10.5 requires that the OPRM be verified to be enabled when power is greater than or equal to 30% of rated thermal power and the recirculation drive flow is less than or equal to 60% of rated core flow. Since the limits in SR 4.3.10.5 are different than those specified in Figure 3.4.1.1.1, clarify how operation using the OPRM will provide at least the same level of protection as that provided by the regions defined in Figure 3.4.1.1.1.

PSEG Nuclear response:

Analyses have been performed to confirm the stability boundary defined in Technical Specification Figure 3.4.1.1-1 at several power/flow statepoints and burnups throughout the current operating cycle. Upon removal of Figure 3.4.1.1-1 from the TS, similar analyses will continue to be performed that will ensure the BWR Owners' Group Interim Corrective Action (ICA) regions are applicable to (or must be modified to accommodate) operation of the Hope Creek core for the applicable cycle. A brief description of the methodology for determining the applicability of the ICA regions is contained in the following paragraphs.

No explicit power measurement uncertainty is applied to any of the cases in the stability analysis. Since the objective of the analysis is to confirm the existing stability boundary, cases that correspond to the power/flow statepoints on the boundary and inside the boundary are evaluated. Enough conservatism is present in the analysis methodology (described in CENPD-295-P-A, "Thermal-Hydraulic Stability Methodology for Boiling Water Reactors," July 1996) such that power

measurement uncertainty is unnecessary in the evaluation. For example:

1. Core-wide decay ratio calculations are conservatively set to a calculated decay ratio of 0.8.
2. Channel thermal-hydraulic decay ratio calculations are conservatively set to a calculated decay ratio of 0.8.
3. Out-of-phase instability-threshold power calculations are set to either:
   a) The actual threshold power for out-of-phase instabilities calculated minus an uncertainty margin that is calculated as the power required to reduce by 0.2 the core-wide decay ratio under those operating conditions, or
   b) The power at which the core-wide decay ratio is 1.0 (i.e., 20% higher than the core-wide acceptance criteria) if out-of-phase instabilities are not observed following an appropriate out-of-phase perturbation.

The existing Interim Corrective Action regions of the power flow map have been confirmed to be applicable for a core thermal power of up to 3339 MW (rated thermal power), while maintaining the relative % power vs.% flow relationship. The use of the proposed setpoints of greater than or equal to 30% core thermal power and less than or equal to 60% core flow for the auto-enable feature of the OPRM system provides margin to the predicted core powers and flows for which a core decay ratio of greater than or equal to 0.8 is expected to occur.

NRC Question:

2. The submittal proposes to change TS 6.9.1.9 to state that core operating limits related to TS 3/4.3.10 (OPRM) will be documented in the core operating limits report (COLR). This TS relates to instrumentation requirements rather than core operating limits. Please identify those cycle-specific core operating limits or setpoints applicable to this proposed change to the COLR.

PSEG Nuclear response:

The period based algorithm amplitude trip setpoint S_p will be documented in the COLR. Section 6.0 of NEDO-32465 describes the Reload Review, which confirms that the OPRM setpoints and initial MCPR value (IMCPR) will provide high confidence that the MCPR safety limit will not be violated for anticipated stability related oscillations.

The amplitude trip setpoint S_p for the OPRM system is cycle specific due to its derivation through the methodology found in NEDO-32465. A corresponding value of the confirmation count trip setpoint N_p is also found in Table 3-2 of NEDO-32465.

Using the equation of NEDO-32465 section 4.5.1, final MCPR (FMCPR) can be determined from:

$$FMCPR = IMCPR - IMCPR * \left(\frac{\Delta CPR}{IMCPR} \right)$$

The licensing criteria for OPRM are met provided FMCPR is greater than the MCPR safety limit. The IMCPR is calculated using the 3-D nodal simulator POLCA. The value of IMCPR is the minimum value that results from 2 different scenarios.

1. A two recirculation pump trip from rated power on the highest allowable rod line. The IMCPR is the MCPR that exists after coastdown to natural circulation and after feedwater temperature reaches equilibrium. It is assumed that the reactor is operating at the MCPR operating limit just prior to the pump trip.

2. The reactor is operating steady state at 45% core flow on the highest allowable rod line and at the MCPR operating limit applicable to those conditions.

The quantity of (ΔCPR/IMCPR) is derived using the ΔCPR/IMCPR vs. Oscillation Magnitude (DIVOM) curve and a plant specific Hot Bundle Oscillation Magnitude calculation. The Hope Creek Hot Bundle Oscillation Magnitude calculation relates the Hot Bundle Oscillation Magnitude to a corresponding amplitude setpoint value (S_p) to be used in the OPRM system. Since the calculation of IMCPR is cycle specific, the corresponding value of S_p (and N_p) become cycle specific in order to satisfy the requirement that the FMCPR value is greater than the MCPR safety limit. This evaluation is still ongoing for Cycle 11.