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LAR H15-01

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

Hope Creek Generating Station  
Renewed Facility Operating License No. NPF-57  
NRC Docket No. 50-354

Subject: **SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF  
REQUESTED LICENSING ACTION RE: AMENDMENT REQUEST  
REGARDING DIGITAL POWER RANGE NEUTRON MONITORING SYSTEM  
UPGRADE (CAC No. MF6768)**

- References
1. PSEG letter to NRC, "License Amendment Request - Digital Power Range Neutron Monitoring (PRNM) System Upgrade," dated September 21, 2015 (ADAMS Accession Nos. ML15265A224 and ML15265A225)
  2. NRC letter to PSEG, "Hope Creek Generating Station, Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment Request Regarding Digital Power Range Neutron Monitoring System Upgrade," dated November 17, 2015 (ADAMS Accession No. ML15313A180)

In the Reference 1 letter, PSEG Nuclear LLC (PSEG) submitted a license amendment request for Hope Creek Generating Station (HCGS). The proposed amendment would revise the HCGS Technical Specifications to reflect the installation of the General Electric-Hitachi (GEH) digital Nuclear Measurement Analysis and Control (NUMAC) Power Range Neutron Monitoring (PRNM) system.

In the Reference 2 letter, the U.S. Nuclear Regulatory Commission staff requested that PSEG supplement the application with information necessary to enable the NRC staff to begin its detailed technical review. A conference call was held with the NRC on November 4, 2015, to

clarify the supplemental information request. The requested information is provided in Attachment 1.

PSEG has determined that the information provided in this submittal does not alter the conclusions reached in the 10 CFR 50.92 no significant hazards determination previously submitted. In addition, the information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please contact Brian Thomas at (856) 339-2022.

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

Executed on Nov. 19, 2015  
(Date)

Respectfully,



Paul Davison  
Site Vice President  
Hope Creek Generating Station

Attachment 1 Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment Request Regarding Digital Power Range Neutron Monitoring System Upgrade (CAC No. MF6768)

cc: Mr. D. Dorman, Administrator, Region I, NRC  
Mr. Thomas J. Wengert, Project Manager, NRC  
NRC Senior Resident Inspector, Hope Creek  
Mr. P. Mulligan, Chief, NJBNE  
Mr. L. Marabella, Corporate Commitment Tracking Coordinator  
Mr. T. MacEwen, Hope Creek Commitment Tracking Coordinator

Attachment 1

Supplemental Information Needed for Acceptance of Requested Licensing Action Re:  
Amendment Request Regarding Digital Power Range Neutron Monitoring System Upgrade  
(CAC No. MF6768)

## **NRC Request 1**

*Section 4.1.2.5, "Human Factors Evaluation," of Attachment 1 to the LAR states, in part:*

*Human Factors engineering is addressed as part of the PRNM design change package (DCP), including changes to the operator panel, as discussed below.*

*Section 4.1.2.5 further states:*

*Detailed analysis of compliance with NUREG-0700 will be documented with the completion of the detailed design. The Phase 2 submittal of this PRNM LAR (provided approximately one year after this Phase 1 submittal) will provide a description of the NUREG-0700 compliance. A discussion of the OE [operating experience] assessed to support the PRNM upgrade will also be provided.*

*Section 3.19, "Information Readout," of the Safety Evaluation Report (SER) for NEDC-32410P-A (the proprietary Licensing Topical Report for NUMAC PRNM referenced in the LAR), states, in part:*

*The licensees should ensure that additions or modifications to the plant operator's panel will receive human factors reviews per plant-specific procedures.*

*Section 5.0, "Plant-Specific Actions," of the SER for NEDC-32410P-A, states, in part:*

*Licensees referencing NEDC-32410 for implementation of the PRNMS should provide the following information in their license amendment submittals ...  
(6) Confirm that any changes to the plant operator's panel have received human factors reviews per plant-specific procedures.*

*Provide supplemental information describing how the human factors have been considered in the initial stage and throughout the development process, as required by DI&C-ISG-06 for a Phase 1 submittal. Specifically, the information provided should demonstrate compliance with the guidance provided in NUREG-0700 and NUREG-0711, as applicable. All elements of the HFE program applicable to the proposed modification, as described in NUREG-0711, should be addressed, including, but not limited to: Operating Experience Review, Task Analysis, impact on procedures and operator training, etc.*

## **PSEG Response**

As discussed in Section 4.1.2.5 of the LAR, an assessment of compliance with NUREG-0700 is required as part of the PSEG Configuration Change process for the PRNM upgrade. This assessment will also address the review elements identified in NUREG-0711, verifying that human factors engineering has been integrated into the PRNM upgrade. The assessment will be placed in the HCGS PRNM Electronic Reading Room portal<sup>1</sup>, in the second quarter of 2016.

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<sup>1</sup> PSEG has established an Electronic Reading Room (ERR) portal consistent with the "Sharepoint" discussion in the January 29, 2015 Pre-Submittal Meeting (ADAMS ML15043A239).

## **NRC Request 2**

*Section 4.1.2, "Instability," of Appendix I to non-proprietary report NEDO-33864, Revision 0 (which is provided as Enclosure 2 to the LAR), states, in part:*

*The diverse means for the safety trip function performed by the DSS-CD [Detect and Suppress Solution-Confirmation Density] algorithms at HCGS for the postulated common-cause failure (CCF) in PRNM is Manual Operator Action.*

*Section 4.1.2 further states:*

*[I]f both the OPRM system is inoperable and the [Automatic Backup Stability Protection] ABSP function cannot be implemented or is inoperable, the licensed stability solution becomes the Manual Backup Stability Protection (BSP) Regions with the BSP Boundary, which is manually implemented through administrative actions. This is essentially the same backup approach utilized in Option III for the [Period Based Detection Algorithm] PBDA algorithm. In the Option III solution there is only one BSP Option, which is provided by the Manual BSP Regions and associated operator actions.*

*Provide supplemental information regarding the analysis that was performed in accordance with NUREG-0800, Appendix 18-A, demonstrating that: (1) the time available to perform the required manual actions is greater than the time required for the operator(s) to perform the actions, and (2) the operator(s) can perform the actions correctly and reliably in the time available. The time available to perform the actions should be based on analysis of the plant response to the AOO/PA using realistic assumptions, and the acceptance criteria of BTP 7-19. The time required for operator action should be based on an HFE analysis of operator response time.*

## **PSEG Response**

Appendix I of NEDC-33864P, Section 4.1.2 (Enclosure 3 of the Phase 1 LAR) identifies two scenarios that require manual operator action for diversity to address the postulated common-cause failure (CCF) in the PRNM system. As discussed in Section 4.1.2, existing manual operator actions are relied on for these two scenarios; no operator actions are being added, changed or deleted. For each scenario (Two-recirculation pump trip (2RPT) and Loss of Feedwater Heating (LFWH)), Section 4.1.2 describes the existing manual operator actions:

*2RPT: "HCGS procedures [currently] require immediate action to reduce reactor power in order to mitigate possible high growth-rate power oscillations following unanticipated core flow reduction events..."*

*LFWH: "HCGS procedures [currently] require immediate action to reduce and maintain reactor power at the pre-event value..."*

Consequently, since existing operator actions are being relied on, there are no new, changed or deleted actions to be analyzed in accordance with NUREG-0800, Appendix 18 – A.

The diverse indications supporting the above existing manual operator actions are described in Section 4.1.2. The related procedures for these manual operator actions can be placed in the HCGS PRNM Electronic Reading Room portal for NRC Staff review.

### **NRC Request 3**

*Section 3.17, "Access to Setpoint Adjustments, Calibration, and Test Points," of the SER for NEDC-32410P-A, states, in part:*

*Set point adjustments, calibrations, and testing processes are performed using the NUMAC operator interface panel. Access to panel functions is controlled via a keylock on the interface panel and different levels of passwords for access to software-based settings. The licensee should confirm that administrative controls are provided for manually bypassing APRM/OPRM channels, or protective functions, and for controlling access to the PRNMS panel and the APRM/OPRM channel bypass switch.*

*Section 5.0, "Plant-Specific Actions," of the SER for NEDC-32410P-A, states, in part:*

*Licensees referencing NEDC-32410 for implementation of the PRNMS should provide the following information in their license amendment submittals...*

*(5) Confirm that administrative controls are provided for manually bypassing APRM/OPRM channels or protective functions, and for controlling access to the panel and the APRM/OPRM channel bypass switch.*

*Section 4.4.2, "LPRM Detector I/V Curves," of Appendix F2 to NEDC-33684P, Revision 0, identifies two actions related to administrative controls required for I/V curve requirements.*

*Provide supplemental information describing the process that will ensure specific administrative controls are provided for manually bypassing APRM/OPRM channels, or protective functions, for controlling access to the PRNMS panel and the APRM/OPRM channel bypass switch, and for addressing the I/V curve requirements as described in Section 4.4.2 of Appendix F2 to NEDC-33864P, Revision 0. Specifically describe if such administrative controls are accomplished by revising existing procedures or instituting new procedures, and identify the impact on operator training, if any.*

### **PSEG Response:**

The PSEG Configuration Change process requires assessment of the configuration change on station procedures, training, simulator and testing. The various department impacts are required to be considered and addressed. This includes providing the required administrative controls identified as part of the PRNM upgrade (e.g., manually bypassing APRM/OPRM channels or protective functions, controlling access to the panel and the APRM/OPRM channel bypass switch, and the identified controls related to I/V curves).

The draft implementing procedures are sent to the impacted departments to review and confirm that the changes have been properly addressed. The draft implementing procedures will be completed in the first quarter of 2016 such that the procedures can be further validated during the Factory Acceptance Test (FAT), scheduled for February 2016. As stated in response to Request 1, PSEG will provide the human factors assessment in the second quarter of 2016; this will include a description of the procedure development and required administrative controls.