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

February 9, 2011

LICENSEE: PSEG Nuclear, LLC

FACILITY: Hope Creek Generating Station

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON SEPTEMBER 15, 2010, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND PSEG NUCLEAR, LLC, CONCERNING QUESTIONS PERTAINING TO THE HOPE CREEK GENERATING STATION LICENSE RENEWAL APPLICATION

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of PSEG Nuclear, LLC, and Exelon held a telephone conference call on September 15, 2010, to discuss and clarify the staff's questions concerning the Hope Creek Generating Station license renewal application. The telephone conference call was useful in clarifying the intent of the staff's questions.

Enclosure 1 provides a listing of the participants and Enclosure 2 contains a brief summary of the discussion and status of the items. Enclosure 3 contains the draft response to the request for additional information.

The applicant had an opportunity to comment on this summary.

Bennett M. Brady, Project Manager
Projects Branch 1
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosures:
1. List of Participants
2. Summary of meeting discussion
3. Draft response to RAI

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TELEPHONE CONFERENCE CALL
HOPE CREEK GENERATING STATION
LICENSE RENEWAL APPLICATION

LIST OF PARTICIPANTS
September 15, 2010

PARTICIPANTS	AFFILIATIONS
Bennett Brady	U.S. Nuclear Regulatory Commission (NRC)
Allen Hiser	NRC
On Yee	NRC
Christopher Wilson	Exelon
Don Warfel	Exelon
Tom Quintenz	Exelon
Al Fulvio	Exelon
Jim Stavely	PSEG Nuclear
Randy Schmidt	PSEG Nuclear
Terry Herrmann	Structural Integrity Associates
Keith Evon	Structural Integrity Associates

ENCLOSURE 1

SUMMARY OF MEETING ON QUESTIONS ON THE
HOPE CREEK GENERATING STATION LICENSE RENEWAL APPLICATION
METAL FATIGUE PROGRAM

SEPTEMBER 15, 2010

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of PSEG Nuclear, LLC (PSEG or the applicant) held a telephone conference call on September 15, 2010, to discuss and clarify the questions concerning the Hope Creek Generating Station (Hope Creek or HCGS) license renewal application (LRA) regarding the Metal Fatigue Monitoring Program.

The applicant's LRA stated that the Metal Fatigue of Reactor Coolant Pressure Boundary (RCPB) Program monitors and tracks the number of critical thermal and pressure transients to ensure that the cumulative usage factors (CUFs) for selected RCPB components remain less than 1.0 through the period of extended operation. The applicant also stated the program determines the number of transients that occur and uses the software program FatiguePro® to compute the CUFs for select locations.

The staff noted that the LRA does not provide sufficient information or detail describing the confirmatory evaluation that was performed to verify the conservatism of the Green's Function and associated stress based fatigue methodology. The staff also noted that the LRA does not describe in detail how the FatiguePro® software will be used in monitoring the CUF for the reactor pressure vessel components and how the software will adjust if new transients are observed or the distributions of transients changes.

The NRC staff and applicant discussed the applicant's proposed response to the NRC's request for information. During the teleconference call between the staff and the applicant, the applicant proposed that it will amend the LRA to state that the stress-based fatigue (SBF) monitoring module of FatiguePro® will not be used. The applicant also proposed that if SBF monitoring is used in the future, it will consider the six-stress terms in accordance with the methodology from ASME Code Section III, Subsection NB, Subarticle NB-3200.

ENCLOSURE 2

RAI 4.3-01 and Draft Response

Background:

Pursuant to 10 CFR 54.21(c)(1)(i) - (iii), an applicant must demonstrate one of the following: (i) the analyses remain valid for the period of extended operation, (ii) the analyses have been projected to the end of the extended period of operation, or (iii) the effects of aging on the intended function(s) will be adequately managed for the period of extended operation.

Issue (Part 1):

LRA Table 4.3.1-1 states that the limiting number of cycles for loss of feed water (FW) heaters (turbine trip with 100% steam bypass and partial FW heater bypass) is 23. In UFSAR Table 3.9-1a, the loss FW heaters transient is separated into two transients for turbine trip with 100% steam bypass and for partial FW heater bypass with three and 20 limiting numbers of cycles, respectfully. It is not clear to the staff whether (i) in the fatigue analyses for the FW nozzles these transients were accounted for as two separate transients and (ii) they should be included into the Metal Fatigue of Reactor Coolant Pressure Boundary Program as two transients with three and 20 limiting numbers of cycles.

Request (Part 1):

Clarify whether (i) in the fatigue analyses for the FW nozzles, the loss of FW heaters transients were accounted for as two separate transients and (ii) they should be included in the Metal Fatigue of Reactor Coolant Pressure Boundary Program as two transients with three and 20 limiting numbers of cycles.

PSEG Response:

Part 1

Confirmation of Separate Transient Use

(i) In the fatigue analyses for the FW nozzles, the turbine trip with 100% steam bypass and the partial FW heater bypass were accounted for as two separate transients

(ii) These transients are included in the Metal Fatigue of Reactor Coolant Pressure Boundary aging management program (Hope Creek LRA Appendix B, Section B.3.1.1) and are counted as two separate transients per the current design basis. As stated in the LRA section 4.3.1, page 4-24, the number of design basis cycles does not represent a design limit. The fatigue usage for a component is normally the result of several different thermal and pressure transients. Exceeding the number of cycles for one transient does not necessarily imply the fatigue usage will exceed an acceptance limit. As such, the two transients will not have limits set for them, since the calculated fatigue usage factor will be the limiting value monitored by the Metal Fatigue of Reactor Coolant Pressure Boundary aging management program.

In the case of the FW nozzles, fatigue usage is not calculated directly as a result of specific transient cycles using cycle-based fatigue (CBF). As part of the enhanced program (Enhancement No. 2), FW nozzle fatigue monitoring will be performed using fatigue monitoring software, incorporating a stress-based fatigue (SBF) approach.

As described in LRA section 4.3.1, page 4-24, SBF consists of computing a "real time" stress history for a given component from actual temperature, pressure, and flow histories. The cumulative usage factor (CUF) is then computed from the stress history using appropriate cycle counting techniques and fatigue analysis methodology. A confirmatory evaluation has been performed to verify the conservatism of the Green's Function and associated SBF methodology.

The "confirmatory evaluation" consisted of a benchmark analysis for all SBF locations (feedwater nozzle safe end and nozzle forging) monitored by the HCGS FatiguePro software to demonstrate that the CUF) calculated by FatiguePro is conservative compared to the CUF calculated in the governing design basis, ASME Code, Section III, NB-3200 fatigue calculation. For each SBF location monitored, the most severe load pair combination expected to occur was evaluated in FatiguePro, and the fatigue results compared to the results from the governing design basis fatigue calculation. The assumption is that performing a comparison of the most severe load pair combination provides a thorough and bounding test of the software, since the highest incremental fatigue usage results were demonstrated to be bounded.

The key parameters used for comparison in the confirmatory calculation were CUF and stress range. The key input parameters that generate fatigue and stress in the feedwater nozzle, pressure and temperature, are the same between the confirmatory calculation and the ASME Code Section III, NB-3200 design basis fatigue calculation as they were based on the same design input. The results indicate that the HCGS FatiguePro software computes conservative CUFs compared to the governing fatigue calculations for each location. Therefore, the FatiguePro software provides conservative predictions of CUF compared to ASME Code, Section III, NB-3200 fatigue calculation methodology, and is acceptable for continued use in fatigue monitoring for the Hope Creek SBF monitored locations through the period of extended operation.

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Memorandum to PSEG Nuclear, LLC from B. Brady, dated February 9, 2011

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