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SEP 0 9 2010

10 CFR 50
10 CFR 51
10 CFR 54

LR-N10-0344

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

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

Subject: License Renewal Commitment List Update associated with the Hope Creek Generating Station License Renewal Application

References:
1. Letter from Mr. Robert C. Braun (PSEG Nuclear, LLC) to USNRC "Response to NRC Request for Additional Information, dated June 25, 2010, Related to Section 4.3 of the Hope Creek Generating Station License Renewal Application," dated July 22, 2010.
2. E-mail from Ms. Bennett Brady, USNRC to Mr. John G. Hufnagel Jr., Exelon "RE: Questions on Hope Creek for Section 4.3 and RAI Response", dated August 17, 2010
3. E-mail from Ms. Bennett Brady, USNRC to Mr. John G. Hufnagel Jr., Exelon, Subject: "Commitment 52- Proposed Update", dated September 2, 2010

In the reference 1 letter, PSEG responded to RAI 4.3-07. In the reference 2 E-mail, USNRC requested a commitment that impacted the original RAI 4.3.07 response. As a result of the reference 2 E-mail and subsequent discussions between NRC Staff and PSEG Nuclear representatives, PSEG Nuclear is providing a replacement RAI 4.3-07 response including a new commitment related to future revisions to environmental fatigue calculations for nickel alloy components. The replacement RAI 4.3-07 response with the new commitment is contained within Enclosure A to this letter.

In addition, based on discussions with NRC Staff and reference 3 E-mail, PSEG Nuclear is providing an update to License Renewal commitment 52, modifying the timing associated with this commitment. The updated LRA pages with the revised commitment are contained within Enclosure B to this letter.

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This submittal has been discussed with the NRC License Renewal Project Manager for the Hope Creek License Renewal project.

There are no other new or revised regulatory commitments contained in this letter.

If you have any questions, please contact Mr. Ali Fakhar, PSEG Manager - License Renewal, at 856-339-1646.

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

Executed on 9/9/10

Sincerely,

Paul J. Davison

Paul J. Davison
Vice President, Operations Support
PSEG Nuclear LLC

Enclosure A: Replacement of RAI Response 4.3-07 related to the Hope Creek Generating Station License Renewal Application

Enclosure B: Changes to LRA sections 4.7.3, A.4.7.3 and Revision to Commitment #52

cc: Regional Administrator – USNRC Region I
B. Brady, Project Manager, License Renewal – USNRC
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector - Hope Creek
P. Mulligan, Manager IV, NJBNE
L. Marabella, Corporate Commitment Tracking Coordinator
T. Devik, Hope Creek Commitment Tracking Coordinator

Enclosure A

Replacement of RAI Response 4.3-07 related to the Hope Creek Generating Station License Renewal Application

Note: Using the original 4.3.-07 RAI response as a reference and to provide clarity, added text is shown in ***Bold Italics***, and deletions are shown with strikethrough text.

RAI 4.3-07

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:

LRA Section 4.3.5 states that Fen factor of 1.49 was used for the Alloy 600 component (control rod drive penetration and core spray nozzle). Also, the LRA does not provide sufficient information to determine what methodology was used in obtaining Fen. Note that NUREG/CR-6909 incorporates more recent fatigue data using a larger database than prior reports for determining the Fen factor of nickel alloys. The basis methodology for the Fen of nickel alloys described in NUREG/CR-6909 is considered by the staff to represent the most up-to-date method for determining the Fen factor for nickel alloys for license renewal considerations.

Request:

(a) Justify using the value of 1.49 for the Fen factor if it is not a bounding/conservative value for the Alloy 600 component when compared to the Fen factor calculated based on NUREG/CR-6909 for nickel alloys.

(b) Describe the current or future planned actions to update the CUF calculation with Fen factor for the Alloy 600 component only, consistent with the methodology in NUREG/CR-6909. If there are no current or future planned actions to update the CUF calculation with Fen factor for the Alloy 600 component consistent with the methodology in NUREG/CR-6909, provide a justification for not performing the update.

PSEG Response:

(a) Basis for Use of 1.49 F_{en} Multiplier for Alloy 600 Materials

The value of 1.49 for F_{en} as shown in LRA Table 4.3.5-1, "Environmental Fatigue Results for HCGS for NUREG/CR-6260 Components", for the Control Rod Drive (CRD) Penetration with Excavation and Core Spray Nozzle Safe End locations is less than the value that would be calculated from NUREG/CR-6909 for nickel alloys. The F_{en} value of 1.49 for Alloy 600 components (control rod drive penetration with excavation and core spray nozzle safe end) is determined based on the Alloy 600 methodology documented in NUREG/CR-6335.

A review was performed which indicates that using NUREG-6909 methodology would result in a conservative value for F_{en} of 3.56 for these two Alloy 600 locations. Using Equations A.14 through A.17 contained in Appendix A to NUREG/CR-6909, this conservative review was based on a reactor maximum temperature of 550°F (288°C), and a value for transformed strain rate to maximize F_{en}. The following relationship was used to account for overall hydrogen water chemistry (HWC) availability of 85% (as presented in Table 4.3.5-1, note 4) for the overall 60-year operating period:

Overall F_{en} = 0.85*F_{en} HWC + (1-0.85)*F_{en} NWC
Overall F_{en} = 0.85*(3.81) + (1-0.85)*(2.12) = 3.56

Using the conservative NUREG/CR-6909 methodology, the resultant environmentally assisted fatigue CUF for the CRD Penetration with Excavation is 0.80. For the Core Spray nozzle safe end, the resultant environmentally assisted fatigue CUF is 0.10. Using the NUREG/CR-6335 methodology, the environmentally assisted fatigue CUF values are 0.4119 for the CRD Penetration with Excavation, and 0.0301 for the Core Spray nozzle safe end, as shown in LRA Table 4.3.5-1. While the calculated environmentally assisted CUF values are higher using the conservative NUREG/CR-6909, they remain below the allowable value of 1.0 using either methodology.

NUREG-1800, Rev 1, Section 4.3.3.2 Generic Safety Issue, states that formulas for calculating the environmental life correction factors are those contained in NUREG/CR-6583 for carbon and low-alloy steels, and in NUREG/CR-5704 for austenitic stainless steels, or an approved technical equivalent. NUREG/CR-6335 is a previously approved technical equivalent for determining environmental life correction factors for Alloy 600 components. Therefore, the value of 1.49 for F_{en} that was calculated based on the Alloy 600 methodology documented in NUREG/CR-6335 is justified for license renewal.

In addition, Regulatory Guide 1.207 endorses the NUREG/CR-6909 methodology specifically for new plants, stating that "Because of significant conservatism in quantifying other plant-related variables (such as cyclic behavior, including stress and loading rates) involved in cumulative fatigue life calculations, the design of the current fleet of reactors is satisfactory." Finally, if the conservative F_{en} value of 3.56 is used and the NUREG/CR-6909 methodology is applied to calculate the 60 year environmentally assisted CUFs for the Hope Creek Alloy 600 locations, the environmentally assisted CUF values remain below 1.0 and are, therefore, acceptable for the period of extended operation.

(b) Describe Planned Actions to Update the CUF Calculation Using NUREG/CR-6909

As presented above, a conservative application of the NUREG/CR-6909 methodology for the Hope Creek Alloy 600 locations (control rod drive penetration with excavation and core spray nozzle safe end) determined the 60-Year CUF values with F_{en} factor remain below 1.0, and are acceptable for the period of extended operation. ~~Therefore, there are no planned actions to update the CUF calculations~~

~~with F_{en} factor consistent with the methodology in NUREG/CR-6909.~~ ***Future revisions/updates to the environmental fatigue calculations for the Hope Creek Alloy 600 locations will use the data and the methodology that is described in NUREG/CR-6909 or later revisions/reports for Ni-Cr-Fe alloys in the determination of the F_{en} factor and fatigue usage.***

The following commitment is added to the A.5 License Renewal Commitment List:

A.5 License Renewal Commitment List

NO.	PROGRAM OR TOPIC	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
53	*Metal Fatigue of Reactor Coolant Pressure Boundary*	*Environmental fatigue calculations for the Hope Creek Alloy 600 locations will use the data and the methodology that is described in NUREG/CR-6909 or later revisions/reports for Ni-Cr-Fe alloys in the determination of the F_{en} factor and fatigue usage.*	*N/A*	*Upon calculation revision/update*	*Letter Number LR-N10-0344; RAI 4.3-07*

Enclosure B

Changes to LRA sections 4.7.3, A.4.7.3 and Revision to Commitment #52

Note: To provide clarity, added text is shown in ***Bold Italics***, and deletions are shown with strikethrough text.

LRA Section 4.7.3 Changes:

Slip Joint Clamp Bolt:

Analysis

The slip joint clamp bolt was previously evaluated for neutron exposure up to a fluence of 1.50E18 n/cm^2 for a 40-year life. To disposition this TLAA, a fluence analysis was performed to determine the fluence value at the location of the installed device at 60 years of plant operation. This analysis determined the slip joint clamp experiences a fluence ***equal to*** ~~greater than~~ that previously evaluated ***upon*** ~~prior to~~ reaching 35.4 Effective Full Power Years (EFPY). Since the analysis does not bound the ~~remaining~~ 60 years of operation, additional actions are required. ~~Prior to the period of extended operation, or~~ ***Two years before*** ~~prior to~~ reaching the ***bounding value*** ~~analyzed limit~~ of 35.4 EFPY, ~~whichever comes first, the plant will either; (1) replace the slip joint clamp or (2) perform~~ an analysis ***will be performed*** that demonstrates the ***function of the*** component ~~function~~ is maintained***, or the slip joint clamp will be replaced at a refueling outage before reaching the bounding value of 35.4 EFPY.***

Disposition: Aging Management, 10 CFR 54.21(c)(1)(iii)

The slip joint clamp TLAA will be dispositioned in accordance with 10 CFR 54.21(c)(1)(iii) by managing the aging effects ~~with the analysis and~~ ***by*** taking ***the*** action as described above ~~prior to the period of extended operation, or~~ prior to reaching the ***bounding value***~~analyzed limit~~ of 35.4 EFPY~~, whichever comes first~~.

LRA Section A.4.7.3 changes:

Slip Joint Clamp Bolt

The fluence analysis for the slip joint clamp bolt determined a fluence value ***equal to*** ~~greater than~~ that previously evaluated ***upon*** ~~prior to~~ reaching 35.4 Effective Full Power Years (EFPY). ~~Prior to the period of extended operation, or~~ ***Two years before*** ~~prior to~~ reaching the ***bounding value*** ~~analyzed limit~~ of 35.4 EFPY, ~~whichever comes first, the plant will either; (1) replace the slip joint clamp or (2) perform~~ an analysis ***will be performed*** that demonstrates the ***function of the*** component ~~function~~ is maintained***, or the slip joint clamp will be replaced at a refueling outage before reaching the bounding value of 35.4 EFPY.*** The slip joint clamp TLAA will be dispositioned in accordance with 10 CFR 54.21(c)(1)(iii) by managing the aging effects ~~with the analysis and~~ ***by*** taking ***the*** action as described above ~~prior to the period of extended operation, or~~ prior to reaching the ***bounding value*** ~~analyzed limit~~ of 35.4 EFPY~~, whichever comes first~~.

LRA Section A.5, License Renewal Commitment List changes:

A.5 License Renewal Commitment List

No.	Program or Topic	Commitment	UFSAR Supplement Location (LRA App. A)	Enhancement or Implementation Schedule	Source
52	Jet Pump Slip Joint Clamp ***Bolt***	PSEG will replace the slip joint clamp or perform an analysis that demonstrates the ***function of the*** component ~~function~~ is maintained.	A.4.7.3	~~Prior to the period of extended operation, or~~ ***Two years before*** ~~prior to~~ reaching the ***bounding value*** ~~analyzed limit~~ of 35.4 EFPY, ***perform the analysis***~~whichever comes first.~~ ***, or replace the slip joint clamp*** ~~***prior the period of extended operation, or***~~ ***at a refueling outage prior to reaching the bounding value of 35.4 EFPY.***	Section 4.7.3; ***Letter Number LR-N10-0344***