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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: License Renewal Commitment Implementation

References: (1) LR-N12-0212, "License Renewal Commitment Implementation," dated July 19, 2012

The Renewed Operating License No. NPF-57 for Hope Creek Generating Station (HCGS) was issued on July 20, 2011. The renewed license included several license conditions related to the ASME Section XI, Subsection IWE aging management program and, in particular, to the Hope Creek drywell air gap drains. In accordance with License Condition 2.C.(27)c, this letter transmits a report summarizing the results of the ultrasonic thickness (UT) measurements taken during Refueling Outage 18.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please do not hesitate to contact Ms. Tammy Morin at 856-339-2299.

Sincerely,

Paul J. Davison

Paul J. Davison
Site Vice President - Hope Creek

Attachment – Hope Creek Generating Station License Renewal Commitment Implementation 90-Day Report for Refueling Outage 18

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Attachment

Hope Creek Generating Station License Renewal Commitment Implementation 90-Day Report for Refueling Outage 18

Hope Creek Generating Station License Renewal Commitment Implementation 90-Day Report for Refueling Outage 18

Background:

Renewed Operating License No. NPF-57 for Hope Creek Generating Station was issued on July 20, 2011. The renewed license contains several license conditions related to License Renewal and, in particular, to the Hope Creek drywell air gap drains. Some portions of these License Conditions were included in the Refueling Outage (RF) 17 scope and were worked during the outage that began on April 13, 2012, and ended on May 9, 2012. Continued investigations and changes were included in RF 18 scope and were worked during the outage that began on October 11, 2013, and ended November 10, 2013.

The relevant license conditions are contained in Section 2.C of the renewed license. Specifically, Section 2.C.(27) delineates those activities required to be performed following the establishment of drainage capability from the drywell air gap (that is, following completion of license condition 2.C.(26)) and reads as follows:

> (27) After drainage has been established from the bottom of the air gap in all four quadrants, the licensee will:
>
> > a. Submit a report to the NRC staff in accordance with 10 CFR 50.4 describing the final drain line configuration and summarizing the testing results that demonstrate drainage has been established for all four quadrants.
> >
> > b. Monitor penetration sleeve J13 daily for water leakage when the reactor cavity is flooded up. In addition, perform a walkdown of the torus room to detect any leakage from other drywell penetrations. These actions shall continue until corrective actions are taken to prevent leakage through J13 or through the four air gap drains.
> >
> > c. Perform UT measurements of the drywell shell between elevation 86'-11" (floor of the drywell concrete) and elevation 93'-0" (bottom of penetration J13) below penetration J13 area during the next three refueling outages. In addition, UT measurements shall be performed around the full 360 degree circumference of the drywell between elevations 86'-11" and 88'-0" (underside of the torus down comer vent piping penetrations). The results of the UT measurements will be used to identify drywell surfaces requiring augmented inspections in accordance with IWE requirements for the period of extended operation, establish a corrosion rate, and demonstrate that the effects of aging will be adequately managed such that the drywell can perform its intended function until April 11, 2046. Within 90 days of completion of each refueling outage, submit a report to the NRC staff in accordance with 10 CFR 50.4 summarizing the results from the UT measurements and if appropriate, corrective action.

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Summary of Commitment Implementation:

The action required by License Condition 2.C.(27)a was completed and the results submitted to the NRC in PSEG Letter No. LR-N12-0212 dated July 19, 2012. In accordance with License Condition 2.C.(27)c, this report discusses the actions taken by PSEG during Hope Creek Refueling Outage 18 (RF18) to satisfy license condition 2.C.(27)b and 2.C.(27)c, above. The specific license conditions addressed and/or resolved during RF18 are as follows:

A. Monitoring of J13 Penetration Sleeve (License Condition 2.C.(27)b)

During RF18, the J13 penetration sleeve was monitored daily for leakage while the reactor cavity was flooded up (October 15 through October 31, 2013). Further, the penetrations adjacent to penetration J13 (J19, J14, J29, J24, and J37, specified here as the "J13 penetration group") and the air gap drains were monitored daily for water leakage. In addition, a full walkdown of the torus room was performed to confirm there was no leakage from any other penetrations. During the walkdowns following reactor cavity flood-up and continuing until reactor cavity drain down, water was observed at the 225 degree azimuth from the J13 penetration group (specifically the J19 penetration) as well as the excavated access tunnel located at 250 degree azimuth (credited air gap drain).

On October 17, 2013, leakage was identified from penetration sleeve J19 at a leak rate of approximately 20 drops per minute. Note that penetrations J13 and J19 are at the same elevation and are separated by approximately 25 inches. No water was noted leaking from other areas within the torus room. On October 18, 2013, approximately 20 drops per minute leakage was observed coming out of the excavated access tunnel at 250 degree azimuth, in addition to the aforementioned leakage from the J19 penetration sleeve, which had continued. The last recorded active leakage from the 250 degree azimuth access tunnel was October 27, 2013. Although the area was "wet" during the October 31, 2013, walkdown, no active leakage was noted. Likewise, the last recorded leakage from penetration sleeve J19 was October 31, 2013.

It was concluded that the leakage observed during RF18 was similar to that observed in RF17. No leakage was observed from other air gap penetration sleeves and there was no sign of leakage from the end of the other three drywell air gap drains (at 80, 160 and 340 degree azimuths) or from the excavated tunnels at 290, 155 and 115 degree azimuths. The Reactor Cavity to Drywell Seal Rupture Drain Alarm did not actuate. All leakage stopped when the reactor cavity was drained.

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B. UT Measurements (License Condition 2.C.(27)c)

The Ultrasonic Thickness (UT) measurements prescribed by license condition 2.C.(27)c were performed during RF18. Based on the consistency of the UT measurements with those taken in previous outages, PSEG has concluded that no corrosion is occurring on the drywell shell.

UT measurements were performed on the drywell shell at the 225 degree azimuth between 86'-11" and 93'-0" elevation (below the J13 penetration group). The lowest UT measurements occurred on a plate below the J13 penetration group and measured 1.475" in RF16, 1.470" in RF17 and 1.471" in RF18. Note that these readings were not at the same measurement point but were the lowest of all recorded readings taken during the respective outages. Comparing the lowest reading of 1.470" to the analysis limit of 1.4375" proves that at least 32.5 mils thickness margin remains. Further, the consistency of the thickness measurements proves that no corrosion to the drywell shell is occurring below the J13 penetration group. It should be noted that during development of the Hope Creek license renewal application, PSEG concluded that the cause of the lower readings on this plate were due to the plate's construction tolerances being at the lower end, but acceptable for use.

UT measurements were also performed for the full circumference of the drywell shell between elevations 86'-11" and 88'-0". The bottom of the drywell air gap is on the outside of the drywell shell between these elevations. The lowest UT measurements at the bottom of the drywell were 1.480" in RF16, 1.477" in RF17 and 1.471" in RF18. Note that these readings were not at the same measurement point but were the lowest of all recorded readings taken during the respective outages. Comparing the lowest reading of 1.471" to the analysis limit of 1.4375" shows that 33.5 mils thickness margin remains. Based on the consistency of these UT measurements, PSEG has concluded that no corrosion is occurring in the drywell shell at the bottom of the drywell air gap. Nevertheless, even if a very conservative corrosion rate of 6 mils per cycle were to be assumed, the analysis limit of 1.4375 would not be reached for at least 5 cycles. The UT measurements will be taken again during the RF19 outage to confirm that no corrosion is occurring in the drywell shell.

The UT measurement activities required to be completed during RF18 by license condition 2.C.(27)c were completed as described above. License condition 2.C.(27)c requires these UT measurement activities for the three refueling outages following establishment of drainage capability from the bottom of the drywell air gap. RF18 is the first of these outages. Therefore, these UT

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measurement activities will continue for the next two refuel outages. Results of the UT measurement activities will be compared to the previous UT measurement results to determine if any corrosion is occurring and to determine a corrosion rate if corrosion is identified. Should a significant corrosion rate be detected, the condition will be entered into the corrective action process for resolution.

C. Corrective Actions

The reactor cavity leakage is currently an ongoing investigation. Additional investigatory actions will be defined for RF19 since the leakage only occurs while the reactor cavity is flooded. While the reactor cavity leakage continues to exist, the actions prescribed by License Condition 2.C.(27) and UFSAR Section A.5, Commitment No 28, Subcommitment 10 (Pages A-70 & 71) will be performed. There were no additional corrective actions as a result of the activities in RF18.

Conclusion:

Activities associated with the Hope Creek renewed operating license condition 2.C.(27) that were required to be completed during the RF18 refueling outage were completed. License Condition 2.C.(27)a was satisfied through submittal of PSEG Letter No. LR-N12-0212 on July 19, 2012. License conditions 2.C.(27)b and 2.C.(27)c were satisfied during RF18 as discussed above. This report satisfies the reporting requirements of 2.C.(27)c. The results of the UT measurements demonstrate there are currently no drywell surfaces requiring augmented inspections in accordance with IWE requirements for the period of extended operation.