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PSEG Nuclear LLC

10 CFR 50.90

LR-N10-0357
September 17, 2010

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: **Supplement - License Amendment Request (H09-01) Supporting the Use of Co-60 Isotope Test Assemblies (Isotope Generation Pilot Project)**

References: (1) Letter from PSEG to NRC, "License Amendment Request Supporting the Use of Co-60 Isotope Test Assemblies (Isotope Generation Pilot Project)," dated December 21, 2009

(2) Letter from PSEG to NRC, "Supplement - License Amendment Request (H09-01) Supporting the Use of Co-60 Isotope Test Assemblies (Isotope Generation Pilot Project)," dated September 10, 2010

In Reference 1, PSEG Nuclear LLC (PSEG) submitted a license amendment request (H09-01) for the Hope Creek Generating Station (HCGS). Specifically, the proposed change would modify License Condition 2.B.(6) and create new License Conditions 1.J and 2.B.(7) as part of a pilot program to irradiate Cobalt (Co)-59 targets to produce Co-60. In addition to the proposed license condition changes, the proposed change would also modify Technical Specification (TS) 5.3.1, "Fuel Assemblies," to describe the specific Isotope Test Assemblies (ITAs) being used.

In Reference 2 PSEG submitted supplemental information on the license amendment request. Following additional discussion with the NRC, it was determined that additional information was needed based on the Reference 2 response. This additional information is provided in Attachment 1 of this submittal.

PSEG has reviewed the information supporting a finding of no significant hazards consideration that was provided in Reference 1. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. No new regulatory commitments are established by this submittal.

If you have any questions or require additional information, please do not hesitate to contact Mr. Jeff Keenan at (856) 339-5429.

SEP 17 2010

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

Executed on SEP 17 2010
(Date)

Sincerely,

John F. Perry
Site Vice President
Hope Creek Generating Station

Attachments (1):

C:

Regional Administrator - NRC Region I
R. Ennis, Project Manager - USNRC
NRC Senior Resident Inspector - Hope Creek
P. Mulligan, Manager IV, NJBNE
Commitment Coordinator – Hope Creek
PSEG Commitment Coordinator - Corporate

NRC Question 1

On page 1 of Attachment 1 to the supplement dated September 10, 2010, PSEG states, in part, that: "The accident analyses provided to support the Co-60 LAR are documented in calculation H-1-ZZ-MDC-1880, Revision 4, and supporting Technical Evaluations 80102291-0030 and 80102291-0040." Technical Evaluation 80102291-0040 seems to supersede 80102291-0030. Should the reference to Technical Evaluation 80102291-0030 be removed for clarity?

RESPONSE

The purpose of TE 80102291-0030 is to justify the deposition of elemental iodine on the walls inside containment in accordance with the guidance of SRP 6.5.2, specifically as it relates to pH of the water film. As such, it is not superceded by TE 80102291-0040. TE 80102291-0030 concludes that the elemental iodine wall deposition model is independent of the chemistry of the water film on the containment surfaces.

NRC Question 2

On page 4 of Attachment 1 to the supplement dated September 10, 2010, PSEG states, in part, that:

> *Amendment 174 assumes an ESF leak rate of 1 gpm, which is doubled in the ESF systems leakage pathway model. The Co-60 LAR assumes an ESF leak rate of 2.85 gpm, which is also doubled in the ESF systems leakage pathway model. The change in leak rate was made to provide operational margin. The assumed leak rate of 2.85 gpm has been incorporated as acceptance criteria in Hope Creek's leakage reduction program, which is maintained in accordance with Technical Specification 6.8.4.a. The use of a higher leak rate is conservative since it results in more activity released to the environment and, therefore, higher doses.*

Section 5.2 of Appendix A to Regulatory Guide (RG) 1.183 states, in part, that:

> *The leakage should be taken as two times the sum of the simultaneous leakage from all components in the ESF recirculation systems above which the technical specifications, or licensee commitments to item III.D.1.1 of NUREG-0737 (Ref. A-8), would require declaring such systems inoperable. [emphasis added]*

Please confirm, consistent with RG 1.183, that when HCGS has operational leakage values above 2.85 gpm, (or the value adjusted for accident conditions) the systems with these leakages are considered inoperable.

Page 5 of Regulatory Issue Summary 2006-04, states, in part, that:

> *The allowable ESF leakage is typically contained in the plant's TS or procedures. The ESF leakage at accident conditions may differ from the ESF leakage at normal operating conditions. Licensees should account for ESF leakage at accident conditions in their dose analyses so as not to underestimate the release rate.*

The DBA LOCA calculation does not appear to make this adjustment. Please confirm that HCGS leakage reduction program adjusts operational ESF leakage to account for accident conditions.

RESPONSE

HCGS operational leakage values above 2.85 gpm, (or the value adjusted for accident conditions) do not require that the systems with these leakages be considered inoperable.

The ESF leakage rate value of 2.85 gpm is established in Calculation No. H-1-ZZ-MDC-1880, Revision 4 (Design Input 5.4.2). The ESF leakage rate was increased from 1 gpm (in Revision 2 of this calculation) to 2.85 gpm to facilitate operational flexibility by providing additional operating margin for ESF leakage. Similar to the previous 1 gpm value, the 2.85 gpm value is not an operational limit. The assumed leak rate of 2.85 gpm has been incorporated into Hope Creek's leakage reduction program (Technical Specification 6.8.4.a) which is implemented via PSEG procedure ER-HC-1051. ER-HC-1051, Step 3.8.1 requires that for water/steam filled systems, the total combined leakage shall not exceed 10,773 cc/minute (10.733 lpm). ER-HC-1051, step 3.5.1.6 requires that if this administrative limit is exceeded, PSEG must prepare a Notification to evaluate system operability.

The HCGS Leakage Reduction Program, ER-HC-1051, does adjust operational ESF leakage to account for accident conditions (i.e., pressure differences). If a leak is identified at normal operating or other conditions, adjustments are made for accident conditions.

NRC Question 3

Page 7 of Attachment 1 to the supplement dated September 10, 2010, states, in part that:

> *However, the assumptions used to address the steam line temperature are conservative. In particular, the flow rate from the drywell into the steam line is based on a constant temperature of 298 °F for the duration of the accident, even though the drywell temperature will drop below this value within a few hours. This conservatively overestimates the amount of activity entering the steam line. The flow rate out of the main steam line is also based on constant temperature, which is the maximum steam line temperature, even though this temperature will decrease substantially over the course of the accident. This produces a conservative estimate of the aerosol effective removal efficiency. It also produces a shorter holdup time in the steam line, which is conservative. In addition, although the steam line temperature and pressure will be higher than the drywell pressure and temperature for the first part of the accident, inhibiting flow through the steam line, assuming that the maximum flow through the steam line starts at the beginning of the accident (time = 0) is conservative.*

Per the Section 3.0, "Determination of MSIV Leakage Rates," of Attachment 3 to the supplement dated September 10, 2010, the flow rate into the steam line from the drywell is not only dependent upon the drywell temperature, but also the drywell pressure. Specifically the flow rate into the steam line from the drywell is based upon the ratio of the temperature of the drywell divided by the pressure of the drywell. It is expected that the pressure in the drywell would likely decrease when the temperature of the drywell decreases. The justification above states correctly states that the temperature in the drywell will decrease after the accident, but

does [not] mention the effect of decreasing drywell pressure. Please consider the effect of drywell pressure in your justification. Also, the NRC staff is hesitant to provide credit for the pressure plugging provided above without a great deal of additional justification. If HCGS plans to pursue this justification, the staff would like to discuss this with HCGS.

RESPONSE

The information provided on page 7 of the September 10, 2010 supplement (discussing Steam Line Deposition Rates and Removal Efficiencies) is revised as follows:

However, the assumptions used to address the steam line temperature are conservative. In particular, the flow rate from the drywell into the steam line is based on a constant drywell temperature of 298 °F and pressure of 50.6 psig for the duration of the accident. The drywell temperature and pressure will drop below these values within a day or two, causing the flow rate into the steam line to decrease. Basing the flow rate on a constant drywell temperature and pressure conservatively overestimates the amount of activity entering the steam line. The flow rate out of the main steam line is also based on constant temperature and pressure, which are the maximum steam line temperature and atmospheric pressure, even though this temperature will decrease substantially over the course of the accident and the initial pressure will be higher than atmospheric. This produces a conservative estimate of the aerosol effective removal efficiency. It also produces a shorter holdup time in the steam line, which is conservative.

The use of the constant maximum steam line temperature to estimate the elemental iodine removal efficiencies is conservative since the steam line temperature will drop to drywell conditions within the first 96 hours of the accident, although the effect is small (less than a 2% increase in dose). Using a more realistic steam line temperature profile will result in an increase in the elemental iodine removal efficiency. This will result in doses that are less than the doses calculated for a constant steam line temperature, although these doses are likely to be greater than the doses calculated using the drywell temperature profile. Given the small effect of constant temperature elemental iodine removal on the doses, the use of the drywell temperature profile for the iodine removal efficiency, as described in Revision 4 of calculation H-1-ZZ-MDC-1880, when combined with the conservative assumptions described above results in a conservative estimate of the doses due to releases through the MSIV leakage pathway.