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Subject: **Response to NRC email dated July 18, 2007 Related to ESBWR Design Certification Application – RAI Number 14.2-63 Supplement 1**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by the Reference 1 NRC email. GEH response to RAI Number 14.2-63 Supplement 1 is addressed in Enclosures 1 and 2.

If you have any questions or require additional information, please contact me.

Sincerely,

James C. Kinsey  
Vice President, ESBWR Licensing

DOG8  
NRD

Reference:

1. Email M. Comar (NRC) to J. Sorensen (GE), Dated July 18, 2007, Subject "MFN 07-378 Response to Portion of NRC RAI Letter 93 RAI 14.2-63"

Enclosures:

1. MFN 08-283 – Response to NRC email dated July 18, 2007 Related to ESBWR Design Certification Application – RAI Number 14.2-63 S01
2. MFN 08-283 – Response to NRC email dated July 18, 2007 Related to ESBWR Design Certification Application – DCD Markups from the Response to RAI Number 14.2-63 S01

cc: AE Cabbage      USNRC (with enclosure)  
GB Stramback      GEH/San Jose (with enclosure)  
RE Brown          GEH/Wilmington (with enclosure)  
DH Hinds          GEH/Wilmington (with enclosure)  
eDRF                0000-0080-5884

**Enclosure 1**

**MFN 08-283**

**Response to NRC email dated July 18, 2007**

**Related to ESBWR Design Certification Application**

**RAI Number 14.2-63 S01**

**NRC RAI 14.2-63 S01**

*GENE should propose to measure the total bypass leakage without using unverified assumptions.*

*In response to RAI 14.2-63, GENE proposed to update ESBWR DCD Section 14.2.8.1.32 in Revision 4 as follows:*

*“The suppression pool bypass leakage rate test will be calculated from data taken in a series of local leak rate tests performed on the drywell to suppression pool vacuum breaker assemblies. Each assembly is tested to determine the leak rate, the total leak rate is the sum of the individually measured values.”*

*To confirm that the drywell to wetwell bypass leakage during a design basis LOCA would be below the value used for the safety analysis, proposed methodology assumes that such leakage occurs only through the drywell to suppression pool vacuum breaker assemblies. This is an unverified assumption.*

*The staff position is that bypass leakage tests are to be performed to confirm that the value used for the safety analysis is not exceeded during a design basis LOCA. GENE should propose to measure the total bypass leakage without using unverified assumptions.*

**GEH Response**

GEH has reviewed the entire subject of drywell to wetwell bypass leakage and the associated measurement methods for total bypass leakage. A decision has been made to revise this subject in the ESBWR DCD.

**DCD Impact**

DCD Tier 2, Chapter 14, Subsection 14.2.8.1.32 will be revised in Revision 5, as noted in the markup in Enclosure 2.

**Enclosure 2**

**MFN 08-283**

**Response to NRC email dated July 18, 2007**

**Related to ESBWR Design Certification Application**

**DCD markups from the Response to RAI Number 14.2-63 S01**

**14.2.8.1.32 Overall Suppression Pool ~~Pressure Suppression Containment~~ Bypass Leakage Tests*****Purpose***

The objective of this preoperational test is to determine the overall suppression pool bypass leakage effective area and to confirm this value is within limits of the low-pressure test acceptance criteria. ~~obtain the baseline data~~ The test method used will form the basis for use during subsequent leakage rate tests conducted at the same frequency as the ILRT. ~~during refueling outages.~~

***Prerequisites***

The SCG has reviewed the test procedures and approved the initiation of testing. A pressurizing source for the drywell and temporary high precision test equipment has been installed in both drywell and wetwell gas space. This instrumentation is within the established calibration interval, has been fully checked out and is ready for the test. ~~Pressurizing and test equipment is checked out and ready for the test.~~ The suppression pool level has been established at the high end of normal range. All penetrations from the drywell to the reactor building and from the wetwell to the reactor building will be isolated. The PCCS vent line spectacle flanges have been installed in the closed position. The vacuum breakers between the wetwell gas space and the drywell are in their normal closed position and the associated isolation valves are open. The reactor building ventilation system is operational.

***General Test Methods and Acceptance Criteria***

The overall suppression pool ~~suppression pool~~ bypass leakage rate test will be performed at low-pressure conditions to detect leakage from the drywell to wetwell gas space that bypasses the assumed flow path through the horizontal vent pipes into the suppression pool. The test will be performed in the following manner: ~~calculated from data taken in a series of local leak rate tests performed on the drywell to suppression pool vacuum breaker pairs. Each assembly is tested to determine the leak rate, the total leak rate is the sum of the individually measured values.~~ Insure any and all paths between the drywell and wetwell gas space have been closed. Vent the wetwell gas space to the reactor building and confirm at zero pressure. Establish drywell pressure at a value  $\geq 2$  psig, but less than a value that would allow venting through the highest horizontal vents, which are submerged in the suppression pool. After this pressure has been established for the minimum stabilization time defined in the test procedure, close the vent from the wetwell gas space to the reactor building and isolate the air supply to the drywell. Monitor and record the pressure, temperature, and humidity for both drywell and wetwell at the prescribed intervals for the necessary test period. Insure the suppression pool water level remains constant during the test period.

Using the data collected and the data reduction method provided in the test procedure, calculate the value of the effective area ( $A/\sqrt{K}$ ) for the overall suppression pool bypass leakage. Verify the calculated value of overall suppression pool ~~drywell to suppression pool gas space~~ bypass leakage rate effective area ( $A/\sqrt{K}$ ) is within the design limit as specified in Subsection 6.2.1.1.5.

**14.2.8.1.33 Containment Isolation Valve Functional and Closure Timing Tests*****Purpose***

The objective of this test is to verify proper function of the containment isolation valves, including the required closure timing are met.