Enclosure 1

MFN 09-257

Response to Portion of NRC Request for

Additional Information Letter No. 301

Related to ESBWR Design Certification Application

- Technical Specifications -

RAI Number 16.2-186

NRC RAI 16.2-186

Correct inconsistency between DCD Section 4.6.1.2.6, Instrumentation and Control, and GTS 3.3.1.1, RPS Function 3, and GTS 3.3.2.1. Page 4.6-17 of Rev 5 of the DCD states:

"Four safety-related pressure sensors are located in the HCU accumulator charging water header. The output signals from these sensors are provided to the RC&IS logic and RPS logic. A low pressure condition from two-out-of-four sensors causes the RC&IS to generate an all-rod-withdrawal block. A low-low pressure condition causes the RPS to generate a reactor scram."

However, (1) the name of GTS 3.3.1.1, RPS Function 3 does not use "Low Low" and "hydraulic control unit (HCU)", and (2) GTS 3.3.2.1 does not contain the rod block function of low pressure in the [control rod drive] HCU accumulator charging water header.

GEH Response

1. GEH will make revisions to the ESBWR Design Control Document (DCD) to correct this inconsistency. To establish a clear identity and to more clearly and consistently communicate the function, DCD Chapters 4 and 7 will be revised to replace various references to "[CRD][HCU] accumulator" with "scram accumulator" and to replace various references to "[CRD][HCU] charging [water] header" with "scram accumulator charging water header." In addition, Chapters 4 and 7 will be revised to consistently refer to the related RC&IS rod block signal and the RPS scram signal as "scram accumulator charging water header pressure – low," and "scram accumulator charging water header pressure – low-low," respectively. Conforming changes will also be incorporated in DCD Chapters 1, 15, 16, 16B and DCD Tier 1.

2. GTS 3.3.2.1, "Control Rod Block Instrumentation," does not include the scram accumulator charging water header pressure – low function because, as discussed below, this control rod block function does not meet any of the 10 CFR 50.36(c)(2)(ii) criteria for inclusion in the GTS.

   Discussion:

   Following is an evaluation of the scram accumulator charging water header pressure – low function for each of the four 10 CFR 50.36(c)(2)(ii) criteria; consistent with the evaluation process outlined in the GEH response to NRC RAI 16.0-1 (MFN 06-263, dated August 8, 2006).

   "*Criterion 1*. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary."

   The scram accumulator charging water header pressure – low function is not used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. Instrumentation meeting the requirements of 10 CFR 50.36(c)(2)(ii) Criterion 1, and that is required to meet the guidance of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection

Systems," is described in DCD Subsections 5.2.5.1.1 (Detection Methods of Leakage Within the Drywell) and 5.2.5.8 (Regulatory Guide 1.45 Compliance).

"*Criterion 2*. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."

Revision 5 of DCD Chapter 15, including the information presented in the Nuclear Safety Operational Analysis (NSOA) in DCD Section 15.1, was reviewed to determine if the scram accumulator charging water header pressure – low function met the requirements of 10 CFR 50.36(c)(2)(ii) Criterion 2. Specifically, the NSOA results provided in DCD Tables 15.1-5 and 15.1-6 and the event diagrams provided in DCD Figures 15.1-1 through 15.1-47 were reviewed. In addition, the event descriptions and the associated tables describing the initial conditions, assumptions, and event sequences for the various safety analyses in DCD Sections 15.2 through 15.4, and other DCD chapters, were reviewed.

The ESBWR safety analyses do not credit the scram accumulator charging water header pressure – low function and the associated control rod block as a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

"*Criterion 3*. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."

Revision 5 of DCD Chapter 15, including the information presented in the Nuclear Safety Operational Analysis (NSOA) in DCD Section 15.1, was reviewed to determine if the scram accumulator charging water header pressure – low function met the requirements of 10 CFR 50.36(c)(2)(ii) Criterion 3. Specifically, the NSOA results provided in DCD Tables 15.1-5 and 15.1-6 and the event diagrams provided in DCD Figures 15.1-1 through 15.1-47 were reviewed. In addition, the event descriptions and the associated tables describing the initial conditions, assumptions, and event sequences for the various safety analyses in DCD Sections 15.2 through 15.4, and other DCD chapters, were reviewed.

The ESBWR safety analyses do not credit the scram accumulator charging water header pressure – low function and the associated control rod block as a structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

"*Criterion 4*. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety."

The control rod block on scram accumulator charging water header pressure – low, which is enforced by the rod block logic of the RC&IS, has not been shown through PRA or operating experience to be significant to public health and safety.

As indicated in DCD subsection 7.7.2.2.3, a failure of the RC&IS does not prevent safe and orderly shutdown, nor can it result in gross fuel failure. It was not found to be risk-significant in the RTNSS review as described in DCD Appendix 19A. Further details on operating experience reviews are documented in DCD Appendix 1C.

DCD Impact

DCD Tier 2 Chapters 1, 4, 7, 15, 16, 16B and Tier 1 will be revised in Revision 6 as discussed above and as shown in Enclosure 2.