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MFN 07-307

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**Subject: Response to Portion of NRC Request for Additional Information  
Letter No. 96 - Overpressure Protection Analysis - RAI Number  
5.2-61**

Enclosure 1 contains GEH's response to the subject NRC RAI transmitted via the Reference 1 letter.

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

Sincerely,



James C. Kinsey  
Project Manager, ESBWR Licensing



NRO

Reference:

1. MFN 07-231, Letter from U.S. Nuclear Regulatory Commission to Robert Brown, *Request for Additional Information Letter No. 96 Related to ESBWR Design Certification Application*, April 12, 2007

Enclosure:

1. MFN 07-307 - Response to Portion of NRC Request for Additional Information Letter No. 96 - Related to ESBWR Design Certification Application - Overpressure Protection Analysis - RAI Number 5.2-61

cc: AE Cabbage USNRC (with enclosures)  
BE Brown GE/Wilmington (with enclosures)  
GB Stramback GE/San Jose (with enclosures)  
eDRF 0000-0067-7035R1

**Enclosure 1**

**MFN 07-307**

**Response to Portion of NRC Request for  
Additional Information Letter No. 96  
Related to ESBWR Design Certification Application  
Overpressure Protection Analysis  
RAI Number 5.2-61**

**NRC RAI 5.2-61:**

*The following statement in the DCD, Tier 2, Revision 1, Section 5.2.6, COL Information, was deleted in Revision 2 (without describing the reason for the deletion):*

*"The COL applicant is required to submit an overpressure protection analysis for core loadings different than the reference ESBWR core loading".*

*Staff believes that the COL action item should have been revised (rather than deleted) to state that: The COL applicant is required to submit an overpressure protection analysis for the actual core for the initial start-up. Please respond as to whether or not GE agrees to staff's position that the above statement should be a COL action item, and if so, revise the DCD accordingly.*

**GEH Response:**

DCD Tier 2, Subsection 5.2.2, includes results of the overpressure protection analysis performed for the reference (equilibrium) ESBWR core loading. The overpressure protection analysis results for the actual initial core to ensure that the acceptance criteria required by the ASME Boiler and Pressure Vessel Code, Section III are still met will be provided in a Licensing Topical Report (GE-Hitachi Nuclear Energy, "ESBWR Initial Core Transient Analyses," NEDO-33337 Class I, Revision 0, Scheduled September 2007). To ensure that the overpressure protection analysis for the actual initial core loading is completed, DCD Tier 2, Subsection 5.2.2.3.2 and Subsection 5.2.7 will be revised to add a reference to NEDO-33337. Therefore, no COL applicant or COL holder item will be added to DCD Tier 2, Subsection 5.2.6, to ensure the initial core loading is analyzed and the results submitted to the NRC.

Similarly, for each subsequent core reload, the COL holders will be required by existing regulatory requirements, including 10 CFR 50.59 and the commitment described in DCD Tier 2, Subsection 5.2.2.3.2, "System Design," to evaluate the impact of the core loading on the overpressure protection analysis for the next cycle. Specifically, in DCD Tier 2, Subsection 5.2.2.3.2, under the heading "Pressurization Events," an "evaluation of event behavior, based on the core loading shown in Figure 4.3-1, demonstrates that MSIV [main steam isolation valve] closure, with scram occurring on high flux, (i.e., MSIV Closure With Flux Scram special event) is the most severe pressurization event... Other fuel designs and core loading patterns, including loading patterns similar to Figure 4.3-1, do not affect the conclusions of this evaluation. Analyses of this event will be performed for each fuel cycle, and the results will be provided to the NRC for information." Therefore, based on the existing regulatory requirements, and the commitment already provided in DCD Tier 2, Revision 3, Subsection 5.2.2.3.2, no COL applicant or COL holder item will be added to DCD Tier 2, Subsection 5.2.6 to ensure that core loadings subsequent to the initial core loading are analyzed and the results submitted to the NRC.

**DCD Impact:**

DCD Tier 2, Subsection 5.2.2.3.2 and Subsection 5.2.7, will be revised as shown in the attached markup.

## **5.2.2 Overpressure Protection**

### **5.2.2.3 Safety Evaluation**

#### **5.2.2.3.2 System Design**

##### **Pressurization Events**

The evaluation of event behavior, based on the reference equilibrium core loading shown in Figure 4.3-1, demonstrates that MSIV closure, with scram occurring on high flux, (i.e., MSIV Closure With Flux Scram special event, MSIVF) is the most severe pressurization event, the result for this event is similar to the ~~TTNBP~~ Turbine Trip With Total Turbine Bypass Failure event evaluated in Subsection 15.3.6. Other fuel designs and core loading patterns, including loading patterns similar to Figure 4.3-1, do not affect the conclusions of this evaluation. An analysis of this event for the actual initial core loading is provided in Reference 5.2-10. Analyses of this event will be performed for each subsequent fuel cycle, and the results will be provided to the NRC for information. Table 5.2-3 lists the systems that could initiate during a MSIV Closure With Flux Scram special event.

**5.2.7 References**

- 5.2-10 GE-Hitachi Nuclear Energy, "ESBWR Initial Core Transient Analyses", NEDO-33337  
Class I, Revision 0, Scheduled September 2007.