



GE Energy

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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 79 Related to ESBWR Design Certification Application –
Technical Specifications – RAI Number 16.2-110**

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

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Kathy Sedney for".

James C. Kinsey
Project Manager, ESBWR Licensing

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Reference:

1. MFN 06-393, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 79 Related to ESBWR Design Certification Application*, October 11, 2006

Enclosure:

1. MFN 07-025 – Response to Portion of NRC Request for Additional Information Letter No. 79 Related to ESBWR Design Certification Application – Technical Specifications – RAI Number 16.2-110

cc: AE Cabbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0060-4198

Enclosure 1

MFN 07-025

Response to Portion of NRC Request for

Additional Information Letter No. 79

Related to ESBWR Design Certification Application

- Technical Specifications -

RAI Number 16.2-110

NRC RAI 16.2-110

Proposed Technical Specification (TS) Section 3.6, Containment Systems, apparently does not have a TS for containment oxygen concentration. GE's response to RAI 16.0-1, dated August 8, 2006, in Enclosure 1, Attachment 2, item 27, asserts that an operating restriction on oxygen concentration (to less than 4% by volume) is not required as an initial condition in the analysis of any design-basis event, so it does not meet Criterion 2 of 10 CFR 50.36 and is not included in the proposed Technical Specifications.

However, both the NRC staff and the nuclear industry's Technical Specification Task Force have stated that such a TS is required.

- (A) *When 10 CFR 50.44, "Combustible Gas Control in Containment," was revised in 2003, the staff issued a model safety evaluation (SE) for implementation of the revised rule through the Consolidated Line Item Improvement Process (ADAMS Accession No. ML032600597, September 12, 2003). The model SE states, on page 13, that "...requirements for primary containment oxygen concentration will be retained in TS for plant designs with an inerted containment." Furthermore, the current standard TS for BWR/4 plants (NUREG-1433, Rev. 3.1) includes TS 3.6.3.2, Primary Containment Oxygen Concentration, which states that "The primary containment oxygen concentration shall be < 4.0 volume percent."*
- (B) *Technical Specification Task Force Traveler TSTF-447, Rev. 1, dated July 18, 2003, "Elimination of Hydrogen Recombiners and Change to Hydrogen and Oxygen Monitors," which has been accepted by the staff, states: "For plant designs with an inerted containment, the requirement for primary containment oxygen concentration will be retained in Technical Specifications."*

In light of these positions, add a TS limiting containment oxygen concentration to less than 4% by volume.

GE Response

As stated in the model safety evaluation for implementation of the revised 10 CFR 50.44, "Combustible Gas Control In Containment," dated September 12, 2003, the basis for retention of this requirement in Technical Specifications (TS) is that it meets Criterion 2 of 10 CFR 50.36(c)(2)(ii) in that it is 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. This is based on the fact that calculations typically included in Chapter 6 of Updated Final Safety Analysis Reports assume that the primary containment is inerted, that is, oxygen concentration < 4.0 volume percent, when a design basis LOCA occurs.

Design Control Document (DCD), Tier 2, Subsection 6.2.5.5, "Post Accident Radiolytic Oxygen Generation," states that for a design basis loss of coolant accident (LOCA) in the ESBWR, the Automatic Depressurization System (ADS) would depressurize the reactor vessel and the Gravity Driven Cooling System (GDSCS) would provide gravity driven flow into the vessel for emergency core cooling. The safety analyses show that the core does not uncover during this event and as a result, there is no fuel damage or fuel clad-coolant interaction that would result in the release of fission products or hydrogen. Thus, for the ESBWR Design Basis Accident

(DBA), the generation of post accident oxygen would not result in a combustible gas condition and a design basis LOCA does not have to be considered in this regard. Therefore, GE's response to RAI 16.0-1, dated August 8, 2006, in Enclosure 1, Attachment 2, item 27, concluded that containment oxygen assumptions do not meet Criterion 2 of 10 CFR 50.36 and are not included in the proposed Technical Specifications.

This conclusion, that Criterion 2 is not applicable, is also consistent with the existing Industry proposal to revise the Bases for those plants committed to retaining a Specification on oxygen concentration to reflect retention based on Criterion 4 of 10 CFR 50.36 (i.e., TSTF-478, "BWR Technical Specification Changes that Implement the Revised Rule for Combustible Gas Control").

Furthermore, from the Statements of Considerations (SOCs) for the Final Rule adopting the revisions to 10 CFR 50.44 (68FR54123, September 16, 2003) combustible gas control is clearly a beyond design basis accident (i.e., severe accident) issue. Limitations for these beyond design basis accidents have not been applied to evaluations against the criteria of 10 CFR 50.36(c)(2)(ii). Regarding the Technical Specification requirement for inerting, these SOC's acknowledge that for the existing BWR plants: "Retaining the requirement maintains the current level of public protection." This, in effect, mandates applicability of 10 CFR 50.36(c)(2)(ii), Criterion 4, on existing plants.

The ESBWR design certification does not fall under this discussion and reasoning for existing plants (i.e., there is no "current level of public protection" standard to evaluate). Furthermore, 50.36(c)(2)(ii)(D), Criterion 4, does not apply to a process variable or initial condition (e.g., as Criterion 2 does). Criterion 4 is restricted to SSCs. However, because the basis of the ESBWR severe accident analysis assumes containment inerting, GE commits to include an Availability Control, similar to other Regulatory Treatment of Non-Safety Systems (RTNSS) Availability Controls, in an Appendix to DCD Chapter 19. The Availability Control will be modeled after the BWR4 NUREG-1433, LCO 3.6.3.2, "Primary Containment Oxygen Concentration," and will be incorporated in DCD Chapter 19, Revision 3.

DCD Impact

An Availability Control for containment oxygen concentration will be included in an Appendix to DCD, Tier 2, Chapter 19, Revision 3.