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Supplement 1
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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 37 Related to ESBWR Design Certification Application –
Site Characteristics - RAI Number 2.3-10 S01.**

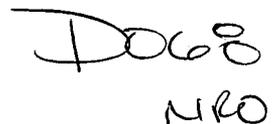
Enclosure 1 contains GEH's response to the subject RAIs transmitted via Reference 1 which is a supplemental request to the RAIs transmitted via Reference 2. The original RAI response was submitted to the NRC via Reference 3.

Should you have any questions about the information provided here, please contact me.

Sincerely,



James C. Kinsey
Vice President, ESBWR Licensing



References:

1. NRC e-mail from Andrea Johnson dated April 2, 2007.
2. MFN 06-201, Letter from U.S. Nuclear Regulatory Commission to David H. Hinds, *Request for Additional Information Letter No. 37 Related to the ESBWR Design Certification Application*, June 21, 2006.
3. MFN 06-396, Letter from GE to U.S. Nuclear Regulatory Commission, *Response to Portion of NRC Request for Additional Information Letter No. 37 Related to ESBWR Design Certification Application – Siting Issues – RAI Numbers 2.1-2, 2.3-7, 2.3-8, 2.3-10, 14.3-23 thru 25, and 15.3-2*, July 31, 2006.

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 37 Related to ESBWR Design Certification Application – Site Characteristics - RAI Number 2.3-10 S01.

cc: AE Cabbage USNRC (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
LE Fennern GEH/San Jose (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
eDRF 0000-0075-6218

Enclosure 1

**MFN 06-396
Supplement 1**

**Response to Portion of NRC Request for
Additional Information Letter No. 37
Related to ESBWR Design Certification Application**

Site Characteristics

RAI Number 2.3-10 S01

For historical purposes, the original text of RAI 2.3-10 and the GE response are included.

NRC RAI 2.3-10

Confirm that the long-term dispersion estimates are reference values only and are not a function of the ESBWR design and list them in DCD Tier 2, Table 2.0-1. The DCD should state that the COL applicant will compare the site-specific X/Q and relative deposition (D/Q) values with the reference X/Q and D/Q values in the DCD and state what the COL applicant should do if the site-specific X/Q or D/Q values exceed the reference X/Q or D/Q values in the DCD.

GE Response

The long-term dispersion estimates are reference values only and are not a function of the ESBWR design. A discussion of the generation of these values is provided in DCD Tier 2, Subsection 12.2.2.1. The long-term dispersion estimates will be listed in DCD Tier 2, Table 2.0-1.

The long-term dispersion estimates are as follows:

X/Q: 2.0E-06 s/m³

D/Q: 4.0E-09 m⁻²

With respect to the statement that the DCD should state that the COL applicant will compare the site-specific X/Q and D/Q values with the reference X/Q and D/Q values in the DCD and state what the COL applicant should do if the site-specific X/Q or D/Q values exceed the reference X/Q or D/Q values in the DCD, a revision to the ESBWR DCD will be made. The following statement will be added to Revision 3 of DCD Tier 2, Chapter 2:

“If a selected site has a X/Q value that exceeds the ESBWR reference site value, the release concentrations in Table 12.2-17 would be adjusted proportionate to the change in X/Q. In addition, for a site selected that exceeds the bounding X/Q or D/Q values, the COL applicant will address how the resulting annual average doses (Table 12.2-18b) continue to meet the dose reference values provided in 10 CFR 50 Appendix I using site-specific X/Q and D/Q values.”

E-mail from A. Johnson dated April 2, 2007.

NRC RAI 2.3-10 S01

Section 12.2.2.1 of DCD Revision 3 states that the Tier 1 and Tier 2 annual average (long term) atmospheric dispersion (X/Q) site design parameter value of 2.0×10^{-6} s/m³ was derived executing the NRC computer code XOQDOQ for 27 US sites and one fictitious site. Similarly, Section 12.2.2.1 of DCD Revision 3 states that the Tier 1 and Tier 2 annual average atmospheric deposition (D/Q) site design parameter value of 4.0×10^{-9} m⁻² was taken from a table of annual average meteorological coefficients prepared by the GE REFAE computer code. The annual average X/Q and D/Q site characteristics for the first three docketed early site permits (e.g., North Anna, Clinton, and Grand Gulf) are all larger (e.g., more conservative) than the ESBWR DCD annual average X/Q and D/Q site design parameters.

Consequently, please provide the following:

- (a) Describe the input assumptions used in executing the XOQDOQ computer code to derive the ESBWR DCD long term X/Q site design parameter value of 2.0×10^{-6} s/m³.*
- (b) Provide the technical bases for the GE REFAE computer code and the input assumptions used in executing the GE REFAE computer code to derive the ESBWR DCD long term D/Q site design parameter value of 4.0×10^{-9} m⁻².*

GEH Response

The third paragraph of Tier 2, Subsection 12.2.2.1 (which discussed the derivation of the ESBWR X/Q and D/Q values) has been deleted in DCD Revision 4. The reason that this paragraph has been deleted is the discussion in that paragraph is irrelevant considering that the ESBWR generic X/Q and D/Q values do not exceed several of the X/Q and D/Q values for the first three docketed early site permit (ESP) applications. However, it is not critical that the ESBWR X/Q and D/Q values bound the ESP values, as other parameters are inputs to the dose calculation in demonstrating compliance with 10 CFR 50 Appendix I dose criteria. The ESBWR assumes only one X/Q and D/Q for all pathways of exposure; the ESP applicant X/Qs and D/Qs vary with respect to location (nearest garden, residence, milk cow, etc.) and are bounded by the ESBWR X/Q and D/Q values for a number of pathways and locations.

DCD Tier 2, Table 12.2-18b demonstrates that the ESBWR meets the 10 CFR 50 Appendix I dose criteria assuming the X/Q and D/Q values in DCD Tier 2, Table 12.2-15. Regardless of the ESP applicant X/Q and D/Q values and their relationship relative to the ESBWR values, the applicant must demonstrate compliance to 10 CFR 50 Appendix I as directed in the COL item in DCD Tier 2, Section 12.2.2.2.

DCD Impact

No DCD changes will be made in response to this RAI.