Comments on ESBWR Section 2.3 RAI responses as contained in GE letters MFN 06-206 and MFN 06-396

Comments on response to RAI 2.3-2 (also related to RAI 14.3-22):
In reviewing the response to the RAI 2.3-2 dated July 31, 2006 contained in MFN 06-206 and the subsequent Revision 3 to the DCD, the staff notes the following regarding the basis for the selected extreme wind standard plant site design parameters:

- The response to RAI 2.3-2 states that the DCD Revision 0 selected extreme wind speed value of 62.6 m/s (140 mph) is approximately in the middle of wind speeds seen in a Category 4 hurricane. Assuming the selected extreme wind speed value is a 3-second gust "basic wind speed value" as defined by SEI/ASCE 7-02, the selected extreme wind speed value represents a strong Category 2 hurricane rather than a moderate Category 4 hurricane. This is because the Saffir-Simpson Hurricane Scale is based on 1-minute average wind speeds whereas the value of the maximum 3-second gust in a hurricane environment is approximately 30 percent higher than the 1-minute average wind speed. Similarly, the higher DCD Revision 3 selected extreme wind speed value of 67.1 m/s (150 mph) represents a weak to moderate Category 3 hurricane.
- Contrary to what is stated in the response to RAI 2.3-2, the updated DCD Revision 3 Tier 2 Table 2.0-1 did not describe the basis for the selected extreme wind standard plant site design parameters.
- It is unclear whether the 49.2 m/s (110 mph) extreme wind standard plant site design parameter for non-seismic structures is a 3-second gust wind speed.

Consequently, please provide the following:

(a) Revise DCD Tier 1 Table 5.1-1 and Tier 2 Table 2.0-1 to provide the basis for the selection of the extreme wind standard plant site design parameters for seismic category I and II structures as well as non-seismic standard plant structures.

(b) Clarify whether the 49.2 m/s (110 mph) extreme wind standard plant site design parameter for non-seismic plant structures is a 3-second gust wind speed.

Comments on response to RAI 2.3-3:
This RAI addresses a concern that the ESBWR zero percent exceedance (historic limit) maximum dry bulb temperature and maximum non-coincident wet bulb temperature standard plant site design parameters may not bound a reasonable number of sites.

In order to determine whether the ambient design temperature standard plant site design parameters bound a reasonable number of sites that may be considered within a COL application, the staff compared the ESBWR ambient design temperature standard plant site design parameters to the ambient air temperature and humidity site characteristics identified in the Safety Evaluations for the first three docketed Early Site Permit Applications. In performing this comparison, the staff considers the zero percent exceedance or historic limit ambient design temperature standard plant site design parameters presented in the ESBWR DCD to be equivalent to 100-year return period ambient air temperature and humidity site characteristic values presented in the first three docketed ESP Safety Evaluations.

The staff found that the ESP 100-year return period maximum dry bulb temperature site characteristic for Clinton, 117 °F, was higher than the ESBWR zero percent exceedance (historic limit) standard plant site design parameter of 115 °F. Likewise, the staff found that the ESP 100-year return period maximum non-coincident wet bulb temperature site characteristics for North Anna and Clinton, 88 °F and 86 °F, respectively, were higher than the ESBWR zero percent exceedance (historic limit) standard plant site design parameter of 85 °F. Consequently, the ESBWR zero percent exceedance (historic limit) maximum dry bulb

temperature and maximum non-coincident wet bulb temperature standard plant site design parameters may not bound a reasonable number of sites that may be considered within a COL application.

Consequently, please revise the ESBWR zero percent exceedance (historic limit) maximum dry bulb temperature and maximum non-coincident wet bulb temperature standard plant site design parameters to be more inclusive of a number of sites that may be considered within a COL application.

Comments on response to RAI 2.3-4:
This RAI addresses the design values and bases for winter precipitation loads to be included in the combination of (1) normal live loads and (2) extreme live loads.

Tier 1 Table 5.1-1 and Tier 2 Table 2.0-1 of DCD Revision 3 state that the maximum design roof load of 2873 Pa (60 lbf/ft^2) accommodates snow load and probable maximum winter precipitation as specified in ASCE 7-02 and HMR-52. The March 24, 1975 Site Analysis Branch Position on Winter Precipitation Loads (ML050470024) states that (1) winter precipitation loads to be included in the combination of normal live loads should be based on the weight of the 100-year snowpack or snowfall, whichever is greater, recorded at ground level, and (2) winter precipitation loads to be included in the combination of extreme live loads should be based on the addition of the weight of the 100-year snowpack at ground level plus the weight of the 48-hour Probable Maximum Winter Precipitation (PMWP) at ground level for the month corresponding to the selected snowpack. Modifications to this procedure are allowed for certain areas where it can be satisfactorily demonstrated that the PMWP could neither fall nor remain entirely on top of the antecedent snowpack and/or roofs.

Consequently, please update the DCD to provide the design values and bases for winter precipitation loads to be included in the combination of (1) normal live loads and (2) extreme live loads. Note that the 48-hour PMWP should be based on data presented in HMR-53.

Comments on response to RAI 2.3-10:
This RAI addresses the design values and bases for winter precipitation loads to be included in the combination of (1) normal live loads and (2) extreme live loads.

Section 12.2.2.1 of DCD Revision 3 states that the Tier 1 and Tier 2 annual average (long term) atmospheric dispersion (χ/Q) site design parameter value of 2.0×10^{-6} s/m^3 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 30 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 χ/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 χ/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 χ/Q site design parameter value of 2.0×10^{-6} s/m^3.

(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}.