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U.S. Nuclear Regulatory Commission
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Subject: **Response to Portion of NRC Request for Additional
Information Letter No. 71 Related to ESBWR Design
Certification Application – Radiation Protection – RAI Number
12.2-20**

Enclosures 1 contains GHNEA's response to the subject NRC RAI transmitted
via Reference 1.

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

Sincerely,



James C. Kinsey
Project Manager, ESBWR Licensing

DO68

Reference:

1. MFN 06-383 – Letter from US Nuclear Regulatory Commission (NRC) to David H. Hinds, *Request for Additional Information Letter No. 71 Related to ESBWR Design Certification Application*, dated October 11, 2006

Enclosures:

1. Response to NRC Request for Additional Information Letter No. 71 Related to ESBWR Design Certification Application – Radiation Protection, RAI Number 12.2-20

cc: AE Cabbage USNRC (with enclosures)
GB Stramback GHNEA /San Jose (with enclosures)
RE Brown GHNEA /Wilmington (with enclosures)
eDRF 0068-8453

Enclosure 1

MFN 07-300

**Response to Portion of NRC Request for
Additional Information Letter No. 71
Related to ESBWR Design Certification Application**

Radiation Protection

RAI Number 12.2-20

NRC RAI No. 12.2-20:

A review of DCD Tier 2, Rev 1, Section 11.3.7 indicates that the radiological consequences of the postulated failure of the charcoal delay bed (Offgas system) were evaluated using the technical guidance of Branch Technical Position ESTB 11-5, as described in NUREG-0800, Standard Review Plan (SRP) Section 11.3.II [Draft Revision 3, dated June 1996]. The method described in ESTB 11.5 requires the use of the BWR-GALE code (NUREG-0016). However, GE's response to NRC RAI No. 12.2-9(b) (GE letter dated July 21, 2006, MFN 06-212) states that BWR-GALE code was not used in the analysis providing an estimate of annual airborne effluent releases. Accordingly, reconcile this inconsistency, update the methodology described in DCD Tier 2, Section 11.3.7, update the analytical parameters listed in DCD Tier 2, Tables 11.3-4 to 11.3-7, and revise doses if the analysis is updated. This clarification and updated information are needed for the staff to independently confirm the approach and dose results presented in DCD Tier 2, Section 11.3.7.

GHNEA Response:

Branch Technical Position ETSB 11-5 (Draft Revision 3, April 1996) states that the fission product release rate is to be consistent with the noble gas release to the coolant of 100 $\mu\text{Ci}/\text{sec}/\text{MWth}$ (after 30 minute decay). The analysis for the postulated failure of the offgas system described in ETSB 11-5 does not require the use of the BWR-GALE code. The BWR-GALE code is only mentioned as the staff method of calculation under the "Staff Method for Analysis" section of ETSB 11-5. The BWR-GALE code is used for determining annual average releases for the offgas system; it does not need to be used for the offgas system failure analysis, as the design basis source term for release is readily available in DCD Tier 2, Table 11.1-2a. With an ESBWR power level of 4500 MWth and the 100 $\mu\text{Ci}/\text{sec}/\text{MWth}$ release rate cited in ETSB 11-5, the resulting offgas release rate is 450,000 $\mu\text{Ci}/\text{sec}$, as cited in DCD Tier 2, Table 11.3-4.

DCD Impact:

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