March 28, 2008

Mr. Robert E. Brown
Senior Vice President, Regulatory Affairs
GE-Hitachi Nuclear Energy Americas, LLC
3901 Castle Hayne Road MC A-45
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 166 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Brown:

By letter dated August 24, 2005, GE-Hitachi Nuclear Energy Americas, LLC (GEH) submitted an application for final design approval and standard design certification of the economic simplified boiling water reactor (ESBWR) standard plant design pursuant to 10 CFR Part 52. The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed design.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

If you have any questions or comments concerning this matter, you may contact me at 301-415-3025 or CPP@nrc.gov, or you may contact Eric Oesterle at 301-415-1365 or ero1@nrc.gov.

Sincerely,

/RA/

Chandu Patel, Senior Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure:
Request for Additional Information

cc: See next page

March 28, 2008

Mr. Robert E. Brown
Senior Vice President, Regulatory Affairs
GE-Hitachi Nuclear Energy Americas LLC
3901 Castle Hayne Road MC A-45
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 166 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Brown:

By letter dated August 24, 2005, GE-Hitachi Nuclear Energy Americas, LLC (GEH) submitted an application for final design approval and standard design certification of the economic simplified boiling water reactor (ESBWR) standard plant design pursuant to 10 CFR Part 52. The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed design.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

If you have any questions or comments concerning this matter, you may contact me at 301-415-3025 or CPP@nrc.gov, or you may contact Eric Oesterle at 301-415-1365 or ero1@nrc.gov.

Sincerely,

/RA/

Chandu Patel, Senior Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure:
Request for Additional Information

cc: See next page
Distribution: See next page
ADAMS ACCESSION NO. ML080810240 NRO-002

OFFICE	PM:NGE1:NRO	PM:NGE1:NRO	BC:NGE1:NRO
NAME	CPatel (cn)	EOesterle	MShuaibi
DATE	03/25/2008	03/25/2008	03/28/2008

OFFICIAL RECORD COPY

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO.160 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED MARCH 28, 2008

Distribution:
PUBLIC

Hard Copy
NGE1/2 R/F
CPatel, NRO
EOesterle, NRO
ACubbage, NRO

E-Mail:
RidsNroDnrlNge1
RidsNroDnrlNge2
RidsAcrsAcnwMailCenter
RidsOgcMailCenter
KWinsberg, OGC
JJolicoeur, RES
SMarshall, RES
MShams
TScarborough
CHinson
APal
SChakrabtti
JRajan
JDixon-Herrity
SSammaddar

Requests for Additional Information (RAIs)
ESBWR Design Control Document (DCD), Revision 4

RAI Number	Reviewer	Question Summary	Full Text
RAI 3.3-3 S02	Shams M	Demonstrate that a potential failure of the Radwaste Building under the ESBWR tornado loads is either precluded or will not affect the ability of seismic Category I structures, systems, and components to perform their safety functions.	The staff considers GEH's response to supplemental RAI 3.3-3 S01 in Letter No. MFN 08-123 inadequate. GEH did not provide the requested information. The information requested by the staff is for GEH to demonstrate that a potential failure of the Radwaste Building (RWB) under the ESBWR tornado loads is either precluded or will not affect the ability of seismic Category I (C-I) structures, systems, and components (SSCs) to perform their safety functions. The staff continues to ask GEH to provide the requested information. This information is requested because DCD Section 3.3.2.3 indicates that the RWB is not located a sufficient distance away from C-I SSCs to preclude adverse interaction. Further, according to Note 1 to DCD Table 2.0-1, the RWB is designed to a lower tornado wind speed than that for C-I SSC. These two conditions do not provide a reasonable assurance that, under tornado loading, adverse interaction between the RWB and the adjacent C-I SSCs is avoided. RG 1.76, Rev. 1 is not referenced by GEH as applicable to the ESBWR design. RG 1.76 Rev. 1 specifies tornado loads that are much lower than those for which GEH is seeking certification for ESBWR. The fact that the RWB is designed to have a sufficient margin not to collapse under the tornado loads specified in RG 1.76, Rev. 1 is not relevant and does not address the potential adverse interaction issue with adjacent C-I SSCs under the ESBWR tornado design criteria.
3.9-14 S02	Wu C	Provide more details about the hand calculations and use of computer codes.	a. In reference to GEH's response dated January 29, 2008, for Item (a) of RAI 3.9-14 S01 regarding the hand calculations used to evaluate the ANSYS calculated stresses to determine if the Appendix F has been met, provide an example of hand calculations performed for meeting the Appendix F requirement.

RAI Number	Reviewer	Question Summary	Full Text
			b. In reference to GEH's response dated January 29, 2008, for Item (c) of RAI 3.9-14 S01, regarding the computer programs to be used by suppliers, explain how GEH will ensure that these suppliers' computer programs for determining the stresses in MSIVs, SRVs, and other ASME Class 1 valves and, ASME Class 2 and 3 valves and pumps are qualified in accordance with 10CFR50 Appendix B and ASME NQA-1 Code.
3.9-168 S02	Scarbrough T	Table 3.9-8 IST Test Intervals	GEH is requested to justify the testing frequencies that have been extended in the revised table beyond refueling outage intervals, such as safety-relief valve (SRV) F006, safety valve F003, SRV discharge line inboard vacuum breaker F007, SRV discharge line outboard vacuum breaker F008, rupture disk F028, and drywell wetwell vacuum breaker valve F002. This information is needed to confirm that the proposed testing frequencies satisfy the NRC regulations that incorporate by reference the ASME Code inservice testing (IST) provisions. In response to RAI 3.9-159, Supplement 1, in MFN 08-109 (dated February 11, 2008), GEH states that Table 3.9-8, "In-Service Testing," in ESBWR DCD Tier 2 was revised to provide more detailed justifications for deferring quarterly IST testing. A justification for extending the testing frequencies identified above was not provided.
3.9-178 S01	Scarbrough T	Valve design-basis capability verification	GEH is requested to clarify its intention to use ASME QME-1-2007. In response to RAI 3.9-178 in MFN 08-131 (dated February 17, 2008), GEH states that Section 3.9.3.5 in the ESBWR DCD Tier 2 will be revised to state that ASME QME-1-2007 is used as guidance in performing the functional qualification of valves. It is unclear how the standard used as guidance will incorporate lessons learned from nuclear power plant operation and research programs for the design and qualification of the capability of valves.

RAI Number	Reviewer	Question Summary	Full Text
3.9-188 S01	Scarbrough T	Other power-operated valve (POV) testing	GEH is requested to indicate that consideration of lessons learned from motor-operated valve (MOV) operating experience for other power-operated valves (POVs) is the responsibility of the COL applicant in developing its Inservice Testing operational program description. In response to RAI 3.9-188 in MFN 08-131 (dated February 17, 2008), GEH states that the establishment of an air-operated valve (AOV) program in response to Regulatory Issue Summary (RIS) 2000-003, "Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions," is the decision and responsibility of the plant license holder. This information should be provided by the COL applicant in fully describing the inservice testing operational program per Commission guidance to enable the NRC staff to reach a safety finding on the ability of the IST program to maintain the design-basis capability of safety-related power-operated valves.
3.9-189 S01	Scarbrough T	Other POV design-basis capability verification	GEH is requested to address the "Specific Testing Requirements" in the ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code), such as stroke-time testing, for POVs. GEH is also requested to indicate that lessons learned from motor-operated valves (MOVs) will be considered for other POVs. In response to RAI 3.9-189 in MFN 08-131 (dated February 17, 2008), GEH states that the discussion of power-operated valves (POVs) other than MOVs would be deleted from Subsection 3.9.6.1.5 in the ESBWR DCD Tier 2. Safety-related POVs need to satisfy the IST provisions in the ASME OM Code. Also, the NRC Standard Review Plan includes acceptance criteria for the NRC staff to consider lessons learned from MOV operating experience for the capability of POVs to perform their safety functions.

RAI Number	Reviewer	Question Summary	Full Text
3.11-26	Hinson C Pal A	Revise Table 3H-5 to correct the integrated dose value listed for the Wetwell and describe how the equipment in the drywell will be protected from the high integrated doses listed for normal operating conditions.	In DCD Tier 2, Rev. 4, Table 3H-5 lists the operating dose rate and the 60-year integrated dose for various zones within the containment vessel. a) The 60-year integrated dose of 1.7 E+2 R listed for the Wetwell appears to be in error since it is not a factor of 7.4 E+5 (number of hours in 60 years) greater than the operating dose of <1.4 R/hr listed in this table for the Wetwell. Revise this table to provide the correct integrated dose value in the Wetwell. b) The 60-year integrated gamma doses listed in Table 3H-5 for the upper and lower drywell areas (plant zones b-1 through b-3) exceed the equipment qualification values for both electronic equipment (10^4 rads) and other equipment (10^6 rads) as stated in the footnote for Table 3H-6. Describe the plant design features which will be used in these drywell areas to ensure that the radiation qualification limits of the equipment in these areas will not be exceeded.
3.11-27	Hinson C Pal A	The integrated doses shown in Table 3H-11 are integrated for 10 hours, not 6 months as indicated in the footnote. Also describe how the equipment in the zones listed will be protected from the high integrated doses during accident conditions.	The following apply to DCD Tier 2, Rev. 4, Table 3H-11. a) The last two columns of Table 3H-11 list the integrated gamma and beta doses for zones b-1 through b-4 in the containment vessel. Footnote (3) of this table states that these doses are integrated over a 6 month period (i.e., the hourly gamma and beta dose rate values given in the first two columns of Table 3H-11 should be multiplied by a factor of 4380 (4380 hours in a 6 month period) to obtain the integrated values in the last two columns). Explain why the integrated doses in the last two columns in this table are only a factor of 10 larger than the hourly doses shown (except for the integrated beta dose for the Wetwell, which is a factor of 12.4 higher). b) Table 3.11-1 states that the equipment listed must remain available or operational for 72 hours. On the basis of the operating dose rates listed in Table 3H-11, the equipment located in various plant zones inside the containment vessel would receive an integrated dose of 1.9 E+9 rads for a 72-hour period. This integrated dose value exceeds the equipment

RAI Number	Reviewer	Question Summary	Full Text
			qualification values for both electronic equipment (10^4 rads) and other equipment (10^6 rads) as stated in the footnote for Table 3H-6. Describe the plant design features which will be used inside the containment vessel to ensure that the radiation qualification limits of the equipment in these areas will not be exceeded.
3.8-25 S05	Chakrabtti S	Revise the analytical models used in the study to address the concerns raised in the RAI or explain how the current study in the RAI response addresses these concerns. In addition explain how the strains tabulated in DCD Table 3G.1-35 are determined, and how buckling was considered in the liner analysis and design.	(1) The response, transmitted in GEH letter dated December 12, 2007, provided some information regarding the analysis of the containment liner plate in the full DCD NASTRAN building model. The information provided in the analytical study of a small portion of the containment wall however, did not address the major concerns raised in the RAI. The small "DCD model" was analyzed and compared to the "contact model" which showed the same strains and reaction forces at the liner anchors. However, under pressure loads the two models are essentially identical and so the strains and anchor loads are expected to be the same. This is similarly true for the thermal loading case. Therefore, it does not appear that the study addresses the concerns raised in the RAI. It was expected that GEH would configure the small DCD model to be identical to the actual full DCD model configuration; that is, it would match the presumed <u>coarser spacing of finite elements with rigid links</u> used in the full DCD model regardless of the actual liner anchor locations. The contact model should then confirm the accuracy of the small DCD model configuration by using a finer discretization (i.e., more finite elements) spaced between the <u>actual locations of the liner anchors.</u> For this contact model, the use of rigid links at the actual anchor locations in both horizontal and vertical directions and the use of contact elements at all other node locations would be acceptable. These two models would not match each other as they do in the current study submitted in the supplemental response. Based on the above, GEH is requested to revise the analytical models or explain how the current study in the RAI response addresses the potential differences between the current liner model in the full DCD model (which does not match the actual liner anchor spacing and has a presumably coarser distribution) and the true liner configuration with actual anchor spacings.

RAI Number	Reviewer	Question Summary	Full Text
			(2) As part of this RAI, GEH is also requested to provide the following information: a. How are the strains tabulated in DCD Table 3G.1-35 determined? Are they obtained directly from the individual finite elements of the full DCD NASTRAN model and are they the maximum membrane and maximum membrane plus bending strain acting in any direction throughout the thickness of the liner plate? b. Since the NASTRAN analysis does not consider potential buckling of the liner plate, GEH is requested to explain if buckling of the liner can occur under the maximum calculated strains for the most critical anchor spacing configuration. If buckling can occur, then describe the calculation performed to obtain the strains in the buckled configuration and demonstrate that they still meet the allowable strain limits in the ASME Code. This should include consideration of the liner strains under thermal local effects on the containment liner due to design basis accident condition. Considering the time-dependent nature of the load, pressure loading may not be present to mitigate the buckling of the liner.
3.8-93 S03	Chakrabarti S	Clarify who will ensure the adequacy of the construction sequence and include this commitment in DCD Tier 2 Subsection 2.	The RAI Supplement 2 response, transmitted in GEH letter dated November 28, 2007, provided information to address five items related to the foundation and soil settlement, seismic soil shear wave velocity requirement, construction sequences, and soil stiffness studies. To address Item (5) in the supplemental response, the staff requests GEH to clarify whether the COL applicant or someone else will determine if the construction sequence is substantially different from the sequences considered in the design, and if substantially different, who will ensure that they will not adversely impact the basemat design. The commitment regarding the construction sequence, with this additional clarification, should also be included in DCD Tier 2 Subsection 2.

RAI Number	Reviewer	Question Summary	Full Text
3.8-94 S03	Chakrabarti S	Provide information to demonstrate the adequacy of the soil bearing capacities and the use of linearly interpolated values for the bearing capacities.	The RAI Supplement 2 response, transmitted in GEH letter dated November 28, 2007, provided information to address five items related to the soil bearing capacities. GEH is requested to addresses the following items: (1) The staff agrees with the statement made in the GEH response that confirmation of the bearing capacity is a COL item. However, the development of the required bearing capacities is part of the DCD review and if the values are extremely large compared to known soil and rock capacities, the staff needs to have a reasonable assurance that these bearing capacities can be met. Therefore, GEH is requested to explain why these extremely large bearing capacities are considered to be reasonable values which can be met at various potential plant sites. (2) GEH is requested to explain why it is acceptable to use a linearly interpolated value for the soil bearing capacities between the three sets of values (soft, medium, and hard). Using the information presented in Figure 3.8-94(1) (c) of the response (as an example), this would underpredict the required bearing capacity. (3) Footnotes are still missing in the revised Table 5.1-1 in DCD Tier 1 Revision 4.
3.8-96 S03	Chakrabarti S	Provide requested information related to structure stability calculations and the use of crystalline powder in the foundation mud mat.	The RAI Supplement 2 response, transmitted in GEH letter dated November 28, 2007, provided information to address nine items related to the stability analyses performed for the ESBWR foundations. The staff requests GEH to address the items discussed below which are still unresolved. The item numbers match the prior RAI Supplement 2 item numbers except for item number 10 which is a follow-up item from RAI 3.8-96, Supplement 1. Note that some of the items discussed below, in the context of sliding stability, are also applicable to overturning stability. (1) In the equation given for passive soil pressure, why was the water pressure considered in resisting sliding, since there would be an equal and opposite water pressure on the other side of the building? Why wasn't the active soil pressure, on the entire foundation wall and basemat vertical

RAI Number	Reviewer	Question Summary	Full Text
			edge, due to static and seismic loads considered on the other side of the building acting in the opposite direction to the passive pressures? Clearly define what surcharge loads (q) were utilized in the equation, because only known permanent surcharge loads (e.g., from other buildings) which would never be removed are appropriate. (2) a. GEH states that the shear strength of the soil, i.e., the resistance at the basemat bottom, is composed of friction and cohesion. However, the procedure described by GEH would only apply to a sliding capacity calculation where failure occurs within the soil medium; it would not apply to a sliding capacity calculation at the concrete to soil interface. Therefore, GEH also needs to consider the sliding capacity caused by sliding resistance between the concrete and soil interface (alone). Typically this consists of the bottom friction resistance term given in Tables 3.8-96(3) and 3.8-96(4) of the RAI response which is identified as "Fub: Bottom Friction Force." If any additional sliding resistance due to cohesion between the soil and concrete at the foundation bottom is used, then describe this approach and explain how it compares to other industry analytical methods such as the Navy Design Manual DM7-02 (available from various websites). Such an approach would require having a cohesive soil which would then become a site interface parameter. This will then need to be placed in DCD Tier 1 and Tier 2, and will need to be satisfied by the COL applicant. Note that whatever approach is used for all soil stability calculations, the evaluations must cover all soil types/conditions that the design certification is intended to cover (e.g., soft, medium, and hard soils; cohesive soils and granular (cohesionless) soils; varying soil friction angle; etc.). b. For the case of sliding frictional resistance capacity between the foundation mat and soil, the staff does not agree that the use of the static coefficient of

RAI Number	Reviewer	Question Summary	Full Text
			friction is conservative. The shear force required to initiate sliding between two surfaces is usually greater than the force required to maintain motion, and therefore it is not conservative to use the higher value to resist sliding. Furthermore, the use of the static frictional resistance at the bottom of the basemat is not consistent with the use of the passive soil resistance at the vertical edge of the basemat. This is because to mobilize the full passive resistance at the vertical edge of the basemat requires some movement of the basemat, in which case, the dynamic sliding friction would be more applicable. Based on the above, GEH is requested to revise their approach to ensure that all of the resisting forces utilized to prevent sliding are developed using a consistent set of assumptions or provide justification for any alternative methods. (3) No additional information needed. (4) The equation provided for the calculation of cohesion (c') for use in sliding evaluations does not appear to be appropriate for its intended use. That is because of the following items: (a) It appears that this equation which determines the cohesion value c' is only applicable for cohesive soils, not granular (cohesionless) soils; (b) The use of the cohesion value is applicable for soil shear capacity calculations where failure may occur within the soil medium; it would not be applicable for a sliding capacity calculation at the concrete to soil interface; (c) The relationship between q_u and cohesion c' and the recommended use of 0.5 to 0.7 of c' for sliding stability evaluations could not be located in Reference 1, which was referred to in the RAI response; (d) The magnitudes of the bearing capacities tabulated in Table 3.8-96(2), which are used to determine c' seem to be unrealistically high. They would require, for the RB/FB medium soil case for example, a soil bearing pressure capacity of 7.3MPa (153ksf) which are extremely large compared to known soil and rock capacities (also identified under RAI 3.8-94). Therefore, GEH is requested to provide the technical basis for application of their approach for all soil types/conditions (e.g., soft, medium, and stiff; cohesive soils and granular (cohesionless) soils; varying soil friction angle; etc.) that the design

RAI Number	Reviewer	Question Summary	Full Text
			certification is intended to cover or utilize other accepted analytical methods typically used for sliding evaluations as discussed under item (2) above. (5) and (6) Please revise the response to these items based on any revision to Item (4). (7) The reduction in contact area between the foundation basemat and the soil, due to some overturning uplift from seismic loads, needs to be considered in the calculations, especially since the margins currently shown in the tables will change and may be reduced when the sliding calculations are revised to address the other items in this RAI. (8) a. Confirm whether the response given means that the analysis and design of the SSCs in the ESBWR plant including development of the floor response spectra were all based on the enveloped responses for the lumped mass models and the SASSI models. If the analysis and design of the SSCs were based only on the lumped mass models, then did all of the building responses (i.e., member forces, nodal accelerations, nodal displacements, and floor response spectra) from the lumped mass models bound the responses from the SASSI models? b. From the response to this item, it appears that the shear wave velocity of the backfill material does not have to match the surrounding undisturbed soil. Since the properties of the backfill material will likely be different, GEH is requested to identify the extent of excavation of the soil during the construction of the plant structures and identify what will be the requirements for the soil properties of the backfill material. If these are different than what were assumed in any of the seismic analyses and designs, then GEH is also requested to provide the technical basis for accepting the differences or confirm that the design basis building responses (including floor response spectra) bound the expected values of the backfill soil properties (including reduced shear wave velocities). In the

RAI Number	Reviewer	Question Summary	Full Text
			case of the foundation walls, GEH is also requested to explain why the elastically calculated wall pressures from seismic and other loads are still appropriate in view of the soil properties (including reduced shear wave velocity) of the backfill material. Unless the analyses and design cover the entire range of possible backfill soil properties, the assumed soil properties for the backfill materials should be considered a requirement, and therefore, clearly stated in the DCD as a site requirement. (9) As noted in the staff's prior assessment of GEH RAI 3.8-96, Supplement 2, response, the traditional method for evaluating the stability (sliding and overturning) of nuclear plant structures in accordance with SRP 3.8 is to perform two separate 2-D evaluations, one for the N-S direction and one for the E-W direction. The minimum vertical downward load (deadweight minus upward buoyancy force minus upward vertical seismic force) is considered separately with the N-S horizontal seismic force and with the E-W horizontal seismic force. In calculating the total upward vertical seismic force, the total N-S horizontal seismic force, and the total E-W horizontal seismic force at the soil/foundation interface, it is acceptable to use either SRSS or 100-40-40 (as defined in RG 1.92, Rev. 2) to combine the individual RESPONSES from response spectrum analyses for the 3 directions of seismic loading. Thus, the SRSS or the 100-40-40 methods are used only to determine the individual total structural response in a given direction (e.g., total shear force in N-S direction) from the individual collinear responses due to each of the three perpendicular seismic excitations (i.e., N-S shear force due to N-S earthquake, N-S shear force due to E-W earthquake, and N-S shear force due to vertical earthquake). The approach GEH is using does not follow this method, but instead combines non-collinear structural responses (i.e., N-S shear force, E-W shear force, and vertical force) following the 100-40-40 method, which is unacceptable. In lieu of this, the results from a 3-D time history analysis using statistically independent inputs can be used, to search the time history response for the worst case combination of vertical and horizontal seismic responses, which minimize the sliding and overturning factors of safety when combined with

RAI Number	Reviewer	Question Summary	Full Text
			deadweight and upward buoyancy force. GEH's proposed application of the 100-40-40 method in this case is not consistent with the staff's acceptance of the method, which as stated in RG 1.92, Rev. 2, applies to combination of individual response components when RSA is used. On this basis, it is not acceptable to the staff. The two approaches described above are acceptable. If GEH chooses to apply an alternate method, then it will need to submit a comparison to results that would be achieved by either one of the two methods described above. (10) The crystalline powder which is proposed by GEH for use in the mud mat concrete below the basemat and which is intended to provide waterproofing to prevent water infiltration or ex-filtration still raises some questions. It appears that the concrete mud mat is unreinforced and therefore, cracking of the mud mat is very likely to occur and the crystalline powder may not be effective in preventing water infiltration or ex-filtration. GEH is requested to provide technical information that demonstrates the effectiveness of the crystalline additive in concrete foundations. This information should include: the requirements necessary for proper use of this product, data which demonstrates its effectiveness under similar conditions (e.g., reinforced or unreinforced concrete, effect on concrete compressive strength, minimum thickness required for the concrete section, water pressure/head capacity and permeability versus water pressure/head, etc.), and what performance testing requirements will need to be satisfied during construction. In addition, specific information needs to be provided in the DCD regarding: the compressive strength of the concrete mud mat, if any reinforcement is needed, the acceptable range of thickness for the concrete mud mat, the inclusion of a statement (which was made in the Supplement 1 response) that "The mud mat construction is performed in accordance with the same standards and requirements as the basemat," and inclusion of performance testing requirements that will be needed during construction of the mud mat (e.g., permeability testing, compressive strength testing, etc.). GEH is also requested to explain what

RAI Number	Reviewer	Question Summary	Full Text
			waterproofing system is relied upon to prevent infiltration of ground water through the walls below grade.
3.9-77 S 02	Rajan J	Provide the justification for extrapolating the stresses in the ESBWR top guide from stresses calculated in the ABWR, based on the guide plate lateral load results from the beam model analyses.	Provide the justification for extrapolating the stresses in the ESBWR top guide from stresses calculated in the ABWR, based on the guide plate lateral load results from the beam model analyses. In particular, comment on any differences in stress concentrations and stress patterns in the ABWR and ESBWR top guides, all of which would have to be the same or very similar in the ABWR and the ESBWR for the extrapolation to provide a reasonable estimate of the stress in the ESBWR top guide.

cc:

Ms. Michele Boyd
Legislative Director
Energy Program
Public Citizens Critical Mass Energy
and Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Ray Ganthner
Senior Vice President
AREVA, NP, Inc. 3315
Old Forest Road
P.O. Box 10935
Lynchburg, VA 24506-0935

DC GE - ESBWR Mailing List

Email

aec@nrc.gov (Amy Cubbage)
APH@NEI.org (Adrian Heymer)
art.alford@ge.com (Art Alford)
awc@nei.org (Anne W. Cottingham)
bennettS2@bv.com (Steve A. Bennett)
bevans@enercon.com (Bob Evans)
bob.brown@ge.com (Robert E. Brown)
BrinkmCB@westinghouse.com (Charles Brinkman)
chris.maslak@ge.com (Chris Maslak)
craig.conklin@dhs.gov (Craig Conklin)
CumminWE@Westinghouse.com (Edward W. Cummins)
cwaltman@roe.com (C. Waltman)
dan1.williamson@ge.com (Dan Williamson)
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
David.piepmeyer@ge.com (David Piepmeyer)
dennis.chin@ge.com (Dennis Chin)
dlochbaum@UCSUSA.org (David Lochbaum)
don.lewis@ge.com (Don Lewis)
erg-xl@cox.net (Eddie R. Grant)
Eugene_Grecheck@dom.com (Eugene S. Grecheck)
frankq@hursttech.com (Frank Quinn)
Frostie.white@ge.com (Frostie White)
gcesare@enercon.com (Guy Cesare)
GEH-NRC@hse.gsi.gov.uk (Geoff Grint)
george.honma@ge.com (George Honma)
george.stramback@gene.ge.com (George Stramback)
george.wadkins@ge.com (George Wadkins)
GovePA@BV.com (Patrick Gove)
greshaja@westinghouse.com (James Gresham)
gzinke@entergy.com (George Alan Zinke)
hickste@earthlink.net (Thomas Hicks)
james.beard@gene.ge.com (James Beard)
jcurtiss@winston.com (Jim Curtiss)
jeff.waal@ge.com (Jeff Waal)
jgutierrez@morganlewis.com (Jay M. Gutierrez)
jim.kinsey@ge.com (James Kinsey)
jim.riccio@wdc.greenpeace.org (James Riccio)
jim.rogers@ge.com (Jim Rogers)
JJNesrsta@cpsenergy.com (James J. Nesrsta)
joel.Friday@ge.com (Joel Friday)
John.O'Neill@pillsburylaw.com (John O'Neill)
john.sorensen@ge.com (John Sorensen)
Joseph_Hegner@dom.com (Joseph Hegner)

DC GE - ESBWR Mailing List

junichi_uchiyama@mnes-us.com (Junichi Uchiyama)
kathy.sedney@ge.com (Kathy Sedney)
kathy.warnock@ge.com (Kathy Warnock)
kenneth.ainger@exeloncorp.com (Kenneth Ainger)
kimberly.milchuck@ge.com (Kimberly Milchuck)
KSutton@morganlewis.com (Kathryn M. Sutton)
kurt.schaefer@ge.com (Kurt Schaefer)
kwaugh@impact-net.org (Kenneth O. Waugh)
laura.bello@ge.com (Laura Bello)
lou.lanese@ge.com (Lou Lanese)
maria.webb@pillsburylaw.com (Maria Webb)
mark.beaumont@wsms.com (Mark Beaumont)
Marvin.Smith@dom.com (Marvin L. Smith)
matias.travieso-diaz@pillsburylaw.com (Matias Travieso-Diaz)
media@nei.org (Scott Peterson)
mgiles@entergy.com (M. Giles)
mike_moran@fpl.com (Mike Moran)
MSF@nei.org (Marvin Fertel)
mwetterhahn@winston.com (M. Wetterhahn)
nirsnet@nirs.org (Michael Mariotte)
PAC2@nrc.gov (Peter Cochran)
pareez.golub@ge.com (Pareez Golub)
Pat.Woodfin@ge.com (Pat Woodfin)
patriciaL.campbell@ge.com (Patricia L. Campbell)
paul.gaukler@pillsburylaw.com (Paul Gaukler)
Paul@beyondnuclear.org (Paul Gunter)
peter.jordan@ge.com (Peter Jordan)
phinnen@entergy.com (Paul Hinnenkamp)
pshastings@duke-energy.com (Peter Hastings)
randy.newton@ge.com (Randy Newton)
RJB@NEI.org (Russell Bell)
RKTemple@cpsenergy.com (R.K. Temple)
roberta.swain@ge.com (Roberta Swain)
sandra.sloan@areva.com (Sandra Sloan)
SauerB@BV.com (Robert C. Sauer)
sfrantz@morganlewis.com (Stephen P. Frantz)
sharon.lyons@ge.com (Sharon Lyons)
steven.hucik@ge.com (Steven Hucik)
steven.stark@ge.com (Steven Stark)
tjh2@nrc.gov (Thomas Herrity)
tom.miller@hq.doe.gov (Tom Miller)
trsmith@winston.com (Tyson Smith)
Vanessa.quinn@dhs.gov (Vanessa Quinn)
VictorB@bv.com (Bill Victor)
Wanda.K.Marshall@dom.com (Wanda K. Marshall)

DC GE - ESBWR Mailing List

waraksre@westinghouse.com (Rosemarie E. Waraks)
wayne.cutright@ge.com (Wayne Cutright)
wayne.marquino@ge.com (Wayne Marquino)
whorin@winston.com (W. Horin)