November 2, 2006

Mr. David H. Hinds, Manager, ESBWR
General Electric Company
P.O. Box 780, M/C L60
Wilmington, NC 28402-0780

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 80 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Hinds:

By letter dated August 24, 2005, General Electric Company (GE) 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. This RAI concerns Chapter 5, 6, and 16 of the ESBWR design control document.

Chapter 5:	5.2-59
Chapter 6:	6.2-138 through 6.2-143
Chapter 16:	Replacement RAI 16.0-5 for the one issued previously in RAI Letter No. 63 on October 4, 2006

To support the review schedule, you are requested to respond to the Chapter 5 and Chapter 6 RAI questions by December 15, 2006.

If you have questions or comments concerning this matter, please contact me at (301) 415-3207 or saw8@nrc.gov or you may contact Amy Cubbage at (301) 415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Shawn A. Williams, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure: As stated

cc: See next page

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Chapter 6:	6.2-138 through 6.2-143
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cc: See next page
ACCESSION NO. ML063060321

OFFICE	NGE1/PM	NGE1/BC
NAME	S.Williams	M.Shuaibi
DATE	10/31/06	11/02/06

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REQUESTS FOR ADDITIONAL INFORMATION (RAIs)
ESBWR DESIGN CONTROL DOCUMENT (DCD) TIER 2, Revision 1, Chapters 5, 6, and 16

RAI Number	Reviewer	Question Summary	Full Text
6.2-138	Pulsipher J	Describe and justify capability for ensuring a mixed containment atmosphere	Describe and justify capability for ensuring a mixed containment atmosphere. 10 CFR 50.44(c)(1) states: *Mixed atmosphere.* All containments must have a capability for ensuring a mixed atmosphere during design-basis and significant beyond design-basis accidents. The following is the complete text of DCD, Tier 2, Revision 1, Section 6.2.5.3.4, "Containment Atmosphere Mixing": The ESBWR design provides protection from localized combustible gas deflagrations including the capability to mix the steam and non-condensable gases throughout the containment atmosphere and minimize the accumulation of high concentrations of combustible gases in local areas. The containment design features that will reduce the likelihood of combustible gas deflagrations resulting from localized buildup of combustible gases during degraded core accidents are listed in Section 19.3. It appears that Section 19.3.2.1, "Hydrogen Generation and Control," is the only part of Section 19.3 that mentions containment atmosphere mixing. The problem is that the only mention of it is a statement that the analysis of post-accident oxygen concentration assumes "Adequate gas mixing throughout containment." Insofar as an assumption is not an explanation or justification, add an appropriate discussion to the DCD which explains and justifies ESBWR's capability for ensuring a mixed atmosphere during design-basis and significant beyond design-basis accidents. The discussion should address: passive features of the design, including containment/subcompartment layout, elevations, and openings between compartments that impact mixing; active features of the design, including ventilation systems, cooling systems, and spray systems; and the effectiveness of the passive and active features in providing a mixed atmosphere in the design-basis and significant beyond design-basis events. If non-safety related systems are relied upon for mixing, the availability of these systems in the frequency-dominant beyond design-basis events and any "special treatment" requirements for these systems should also be addressed.

RAI Number	Reviewer	Question Summary	Full Text
6.2-139	Wagage H	Rapidly reducing containment pressure and temperature requirement in GDC 38	Explain how the ESBWR design complies with 10 CFR 50, Appendix A, Criterion 38. DCD, Tier 2, Revision 1, Section 6.2.2.3 states that "In conjunction with the pressure suppression containment (Subsection 6.2.1.1), the PCCS [passive containment cooling system] is designed to remove heat from the containment to comply with 10 CFR 50, Appendix A, Criterion 38." However, Criterion 38 requires that the containment heat removal system "safety function shall be to reduce rapidly, consistent with the functioning of other associated systems, the containment pressure and temperature following any loss-of-coolant accident and maintain them at acceptably low levels." Ths PCCS does not reduce rapidly the containment pressure and temperature as evident from the TRACG results presented in the DCD.
6.2-140	Wagage H	Increasing containment pressure at 72 hours with a possibility of exceeding the design pressure after 72 hours	For the bounding case, DCD, Tier 2, Revision 1, Figure 6.2-12 for the containment pressure shows a short term peak of 344 KPa and long-term peak pressure of 340 KPa at 72 hours, which is increasing. Please justify that the containment pressure does not exceed the design pressure of 414 KPa after 72 hours.
6.2-141	Wagage H Notafrancesco A	Effect of changing the *bounding case* from FWLB (with one SRV failure) to MSLB (with one DPV) failure on RAI responses	Of the four accidents analyzed (feedwater line break (FWLB), main steam line break (MSLB), gravity-driven cooling system (GDCS) line break, and bottom drain line break (BDLB)), DCD, Tier 2, Revision 1, Section 6.2.1.1.3 states that FWLB (with one safety relief valve (SRV) failure) was bounding. Therefore, the staff's previous RAIs were based on this conclusion. However, in response to NRC RAI 6.2-59, in Enclosure 1 to a letter, dated October 3, 2006, you stated that after correcting a code modeling error, MSLB accident became the bounding case. Please revisit your responses to the staff's previous RAIs on Section 6.2 (e.g., RAI 6.2-98) as a result of this change in the bounding case from FWLB to MSLB and make necessary changes.

RAI Number	Reviewer	Question Summary	Full Text
6.2-142	Wagage H Notafrancesco A	Explain why the modeling of 2 of 3 vacuum breakers are available is conservative	In response to NRC RAI 6.2-59, in Enclosure 1 to MFN-06-364 dated October 3, 2006, GE stated that "The ESBWR design uses 3 vacuum breakers. Assuming one vacuum breaker is out of service for the LOCA [loss-of-coolant accident] analyses, there should be 2 vacuum breakers available for the LOCA transient." Making 3 vacuum breakers available during a LOCA would appear to be more conservative considering that a higher rate of noncondensible flow from the wetwell to drywell would degrade the passive containment cooling system more than when only 2 vacuum breakers are available. Please explain this apparent nonconservative modeling of only 2 of 3 vacuum breakers are available during a LOCA.
6.2-143	Wagage H Notafrancesco A	Justify using nominal input values instead of bounding values for licensing analyses	In response to NRC RAI 6.2-59, in Enclosure 1 to MFN-06-364 dated October 3, 2006, you provided the results of TRACG containment analyses for four accident cases: FWLB, MSLB, GDCS line break, and DBLB. These cases considered the nominal input values as given in Table 6.2-6, DCD Tier 2, Rev. 1. Of the four cases, the MSLB case resulted in the maximum drywell pressure. Please confirm that the MSLB case would give the maximum drywell pressure if bounding input values are considered.
5.2-59	Davis R	Provide clarification and revise the DCD to reference the correct Class of piping	In the paragraph "Hydrostatic Pressure Tests" in DCD Tier 2, Revision 1, Section 5.2.4.6, Class 2 and 3 piping are referenced, but DCD Section 5.2.4 applies to reactor coolant pressure boundary (RCPB) piping. Please provide clarification and revise the DCD to reference the correct Class of piping.
Revised RAI 16.0-5	Hearn P	Explain omission of Specifications based on STS in Plant Systems (3.7), Refueling Operations (3.9), and Programs and Manuals (5.5)	Defense-in-Depth and the design basis require long term functional capability of the Containment, Control Room systems, and supporting systems. This is due to the long term effects of radioactive decay and decay heat. The Containment, Control Room and supporting systems are required to mitigate the effects of design basis and severe accidents. Justify exclusion of the following STS from the ESBWR TS by demonstrating they do not satisfy the inclusion requirements of 10 CFR 50.36: A. Section 3.7 (Service Water System and Ultimate Heat Sink (Cooling Towers), Control Room Fresh Air System, Control Room Heating Ventilation and Air Conditioning System); B. Section 3.9 (Reactor Water Cleanup/Shutdown Cooling System); C. Section 5.5 (Ventilation Filter Test Program, Diesel Generator Fuel Oil Testing Program).

ESBWR Mailing List

cc:

Mr. David Lochbaum, Nuclear Safety Engineer
Union of Concerned Scientists
1707 H Street, NW., Suite 600
Washington, DC 20006-3919

Mr. Paul Gunter
Nuclear Information & Resource Service
1424 16th Street, NW, Suite 404
Washington, DC 20036

Mr. James Riccio
Greenpeace
702 H Street, Suite 300
Washington, DC 20001

Mr. Adrian Heymer
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Paul Leventhal
Nuclear Control Institute
1000 Connecticut Avenue, NW
Suite 410
Washington, DC 20036

Mr. Ron Simard
6170 Masters Club Drive
Suwanne, GA 30024

Mr. Brendan Hoffman
Research Associate on Nuclear Energy
and Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr, Jay M. Gutierrez
Morgan, Lewis & Bockius, LLP
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Mr. Glenn H. Archinoff

AECL Technologies
481 North Frederick Avenue
Suite 405
Gaithersburg, MD 20877

Mr. Gary Wright, Director
Division of Nuclear Facility Safety
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

Mr. Charles Brinkman
Westinghouse Electric Co.
Washington Operations
12300 Twinbrook Pkwy., Suite 330
Rockville, MD 20852

Mr. Ronald P. Vijuk
Manager of Passive Plant Engineering
AP1000 Project
Westinghouse Electric Company
P. O. Box 355
Pittsburgh, PA 15230-0355

Mr. Ed Wallace, General Manager
Projects
PBMR Pty LTD
PO Box 9396
Centurion 0046
Republic of South Africa

Mr. Russell Bell
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Ms. Sandra Sloan
Areva NP, Inc.
3315 Old Forest Road
P.O. Box 10935
Lynchburg, VA 24506-0935

Mr. Robert E. Sweeney
IBEX ESI

4641 Montgomery Avenue
Suite 350
Bethesda, MD 20814

Mr. Eugene S. Grecheck
Vice President, Nuclear Support Services
Dominion Energy, Inc.
5000 Dominion Blvd.
Glen Allen, VA 23060

Mr. George A. Zinke
Manager, Project Management
Nuclear Business Development
Entergy Nuclear, M-ECH-683
1340 Echelon Parkway
Jackson, MS 39213

E-Mail:
tom.miller@hq.doe.gov or
tom.miller@ nuclear.energy.gov
sfrantz@morganlewis.com
ksutton@morganlewis.com
jgutierrez@morganlewis.com
mwetterhahn@winston.com
whorin@winston.com
gcesare@enercon.com
jerald.holm@framatome-anp.com
erg-xl@cox.net
joseph_hegner@dom.com
mark.beaumont@wsms.com
steven.hucik@ge.com
patriciaL.campbell@ge.com
bob.brown@ge.com
david.hinds@ge.com
chris.maslak@ge.com
James1.Beard@ge.com
kathy.sedney@ge.com
mgiles@entergy.com
tansel.selekler@nuclear.energy.gov or
tansel.selekler@hq.doe.gov
Frostie.white@ge.com
David.piepmeyer@ge.com
george.stramback@gene.ge.com
wayne.marquino@ge.com
james.kinsey@ge.com