October 19, 2009

Mr. Jerald G. Head
Senior Vice President, Regulatory Affairs
GE Hitachi Nuclear Energy
3901 Castle Hayne Road MC A-18
Wilmington, NC 28401

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 382 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION

Dear Mr. Head:

By letter dated August 24, 2005, GE Hitachi Nuclear Energy 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 U.S. 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 301-415-3808 or zahira.cruz@nrc.gov, or you may contact Amy Cubbage at 301-415-2875 or amy.cubbage@nrc.gov.

Sincerely,

/RA/

Zahira Cruz Perez, 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

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Distribution: See next page
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OFFICE	PM:NGE1:NRO	PM:NGE1:NRO
NAME	ZCruz Perez	ACubbage
DATE	10/19/09	10/19/09

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SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO.382 RELATED TO ESBWR DESIGN CERTIFICATION APPLICATION DATED OCTOBER 19, 2009

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Requests for Additional Information (RAIs)
ESBWR Design Control Document (DCD), Revision 6

RAI Number	Reviewer	RAI Summary	RAI Text
3.11-28 S01	Pal A	Additional information regarding temperature affecting electrical equipment.	In response to RAI 3.11-28 GEH clarified that the temperatures listed in Tables 3H-2 through 3H4 represents the maximum normal ambient temperatures at the location of the safety-related equipment. Table 3H-3 lists RB room 1720 at 85°F maximum. Table 3H-4 lists the CRHA main control room panels at 74°F maximum. GEH stated that aging analysis and accelerated aging tests determines the service temperature, which considers sources of higher than ambient heat including internally generated heat. GEH stated that this is addressed in DCD Subsection 3.11.3.1. A similar question was asked regarding the expected temperature inside electrical cabinets in these areas. In response to RAI 9.4-34, GEH acknowledged that the airflow through electrical cabinets is assumed to be reduced during the 72-hour post accident period and the normal nonsafety-related HVAC is assumed to be off. In this response, GEH further clarified that the EQ program ensures component performance for temperature, including if the event occurs during maximum summer design temperatures. In addition, in response to this RAI, additional detail was added to DCD Subsection 3.11 to more fully explain the temperature qualification process. The staff has reviewed the changes to DCD Subsection 3.11. In Subsection 3.11.3.1, GEH states that for EQ safety-related computer-based I&C equipment in mild environments, the temperature qualification method would be by test. The maximum qualification temperature is 10°C higher than the maximum temperature to which the equipment is exposed for the worst-case AOO. In Subsection 3.11.3.2, GEH state that the AOO and test condition environments are bounded by the normal or accident conditions according to “the Appendix 3H tables.” In DCD Table 15.2-4a GEH indicate that the Loss of Non-emergency AC Power to Station auxiliaries is an Anticipated Operational Occurrence. Table 3H-9 lists RB room 1720 at 122°F Maximum. Table 3H-10 lists the CRHA main control room panels at 93°F “Average Bulk Max”. The title of both tables indicates that these temperatures apply for accident conditions.

			Table 3H-15 contains a column headed “Max Environment Temperature from Table 3H-9” This column lists 122°F and 93°F for the RB room 1720 and the CRHA respectively. The staff requests the following information: 1. Provide additional details on how the service temperature of electrical equipment, including Computer-based I&C systems, will be determined for the ESBWR. In particular provide details on this process for equipment that is planned to be located inside electrical cabinets/panels in the RB and the CB. Also, discuss how the service temperature will be determined for equipment in harsh environment. 2. Is the worst case AOO and test condition environments for EQ safety-related computer-based I&C equipment bounded by the temperatures in tables 3H-2 through 3H4 or are they bounded by the temperatures in tables 3H-9, 3H10 and 3H-15? 3. Does the worst case AOO for the ESBWR consider the environment resulting from the loss of non-emergency AC Power for a period of 72 hours? 4. The temperatures in tables 3H-9, 3H10 and 3H-15 were derived from a passive cooling analysis. Such analyses have a degree of uncertainty. In addition, the service temperatures for EQ safety-related computer-based I&C equipment located in these environments, during the passive cooling period would be heavily dependent on the detailed design of the surrounding enclosure. In light of these considerations, what assurances have GEH provided in the DCD to indicate that systems are designed such that the derived bounding temperatures would be conservative? 5. What information in the DCD provides assurance that that temperatures inside cabinets or panels would not exceed the Table 3H-13 typical mild environment parameter limit of 145°F at the end of the passive cooling period? 6. What controls will GEH use to ensure that enclosures containing such equipment will be designed and tested to ensure that these key assumptions are met?

3.9-247 S01	Le T	Additional information regarding seismic analysis with sloshing effect of the PCCS and ICS heat exchanger supports.	During the conference call on 10/14/2009, GEH presented the methodology of ICS and PCCS submerged heat exchanger. GEH stated that PCCS heat exchanger support design was completed, but ICS heat exchanger was not. The staff requests GEH to provide the followings: 1. Add a description in ESBWR DCD section 3.9.3.7 about the methodology of the RAI 3.9-247 seismic analysis with sloshing effect and the commitment to apply it to the seismic analysis of ICS and PCCS. 2. Develop and document an ITAAC to confirm the completion of ICS and PCCS submerged heat exchangers support structure design.

cc:

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

Mr. Tom Sliva
7207 IBM Drive
Charlotte, NC 28262

DC GE - ESBWR Mailing List

Email

aec@nrc.gov (Amy Cubbage)
APH@NEI.org (Adrian Heymer)
awc@nei.org (Anne W. Cottingham)
bevans@enercon.com (Bob Evans)
BrinkmCB@westinghouse.com (Charles Brinkman)
cberger@energetics.com (Carl Berger)
charles.bagnal@ge.com
charles@blackburncarter.com (Charles Irvine)
chris.maslak@ge.com (Chris Maslak)
CumminWE@Westinghouse.com (Edward W. Cummins)
cwaltman@roe.com (C. Waltman)
Daniel.Chalk@nuclear.energy.gov (Daniel Chalk
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
David.piepmeyer@ge.com (David Piepmeyer)
donaldf.taylor@ge.com (Don Taylor)
erg-xl@cox.net (Eddie R. Grant)
gcesare@enercon.com (Guy Cesare)
GEH-NRC@hse.gsi.gov.uk (Geoff Grint)
GovePA@BV.com (Patrick Gove)
gzinke@entergy.com (George Alan Zinke)
hickste@earthlink.net (Thomas Hicks)
hugh.upton@ge.com (Hugh Upton)
james.beard@gene.ge.com (James Beard)
jerald.head@ge.com (Jerald G. Head)
Jerold.Marks@ge.com (Jerold Marks)
jgutierrez@morganlewis.com (Jay M. Gutierrez)
Jim.Kinsey@inl.gov (James Kinsey)
jim.riccio@wdc.greenpeace.org (James Riccio)
JJNesrsta@cpsenergy.com (James J. Nesrsta)
joel.Friday@ge.com (Joel Friday)
John.O'Neill@pillsburylaw.com (John O'Neill)
Joseph_Hegner@dom.com (Joseph Hegner)
junichi_uchiyama@mnes-us.com (Junichi Uchiyama)
kimberly.milchuck@ge.com (Kimberly Milchuck)
KSutton@morganlewis.com (Kathryn M. Sutton)
kwaugh@impact-net.org (Kenneth O. Waugh)
lchandler@morganlewis.com (Lawrence J. Chandler)
lee.dougherty@ge.com
Marc.Brooks@dhs.gov (Marc Brooks)
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)

DC GE - ESBWR Mailing List

media@nei.org (Scott Peterson)
mike_moran@fpl.com (Mike Moran)
MSF@nei.org (Marvin Fertel)
mwetterhahn@winston.com (M. Wetterhahn)
nirsnet@nirs.org (Michael Mariotte)
patriciaL.campbell@ge.com (Patricia L. Campbell)
paul.gaukler@pillsburylaw.com (Paul Gaukler)
Paul@beyondnuclear.org (Paul Gunter)
peter.yandow@ge.com (Peter Yandow)
pshastings@duke-energy.com (Peter Hastings)
rick.kingston@ge.com (Rick Kingston)
RJB@NEI.org (Russell Bell)
RKTemple@cpsenergy.com (R.K. Temple)
Russell.Wells@Areva.com (Russell Wells)
sabinski@suddenlink.net (Steve A. Bennett)
sandra.sloan@areva.com (Sandra Sloan)
sara.andersen@ge.com (Sara Anderson)
SauerB@BV.com (Robert C. Sauer)
sfrantz@morganlewis.com (Stephen P. Frantz)
stephan.moen@ge.com (Stephan Moen)
steven.hucik@ge.com (Steven Hucik)
stramback@westinghouse.com (George Stramback)
tdurkin@energetics.com (Tim Durkin)
timothy1.enfinger@ge.com (Tim Enfinger)
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)
wayne.marquino@ge.com (Wayne Marquino)
whorin@winston.com (W. Horin)