March 12, 2008

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 167 RELATED TO NEDE-33244P, REVISION 1, "ESBWR MARATHON CONTROL ROD MECHANICAL DESIGN REPORT"

Dear Mr. Brown:

By letter dated February 1, 2008, Nuclear Regulatory Commission (NRC) staff informed you of the result of the acceptance review of NEDE-33244P, Revision 1, "ESBWR Marathon Control Rod Mechanical Design Report." In that letter, the staff determined that the material presented in the topical report sufficient to begin a detailed review as part of the ESBWR design certification review.

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 301-415-6715 or bmb2@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Bruce Bavol, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure: 1. Request for Additional Information

cc: See next page

March 12, 2008

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 167 RELATED TO NEDE-33244P, REVISION 1, "ESBWR MARATHON CONTROL ROD MECHANICAL DESIGN REPORT"

Dear Mr. Brown:

By letter dated February 1, 2008, Nuclear Regulatory Commission (NRC) staff informed you of the result of the acceptance review of NEDE-33244P, Revision 1, "ESBWR Marathon Control Rod Mechanical Design Report." In that letter, the staff determined that the material presented in the topical report sufficient to begin a detailed review as part of the ESBWR design certification review.

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 301-415-6715 or bmb2@nrc.gov or you may contact Amy Cubbage at 301-415-2875 or aec@nrc.gov.

Sincerely,

/RA/

Bruce Bavol, Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-010

Enclosure: 1. Request for Additional Information

cc: See next page
ACCESSION NO. ML080701129

OFFICE	NGE1	NGE1	NGE1/BC
NAME	BBavol	ACubbage	MShuaibi
DATE	03/10/2008	03/10/2008	03/12/2008

OFFICIAL RECORD COPY

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 167 RELATED TO NEDE-33244P, REVISION 1, "ESBWR MARATHON CONTROL ROD MECHANICAL DESIGN REPORT" DATED MARCH 12, 2008

Distribution:
Hard Copy
NGE1 R/F
BBavol
ACubbage

E-Mail:
NGE1 Group
PClifford
RidsAcrsAcnwMailCenter
AMendiola
RidsOgcMailCenter
GThomas
JDonoghue
CHarris

Requests for Additional Information (RAIs): ESBWR Design Control Document (DCD) Revision 4; NEDE-33244P, Revision 1, "ESBWR Marathon Control Rod Mechanical Design Report"

RAI Number	Reviewer	Question Summary	Full Text
4.2-20	Harris C	Material degradation mechanism issues	Results from the ongoing surveillance program for the BWR/2-6 Marathon design, which was approved in Reference 1 (NEDE-31258P-A), indicate the presence of more than one material degradation mechanism. Since the ESBWR Marathon design employs many of the same design features, please address the following: a) Please provide findings of cracked control blades in the current operating fleet. b) Please provide the Part 21 notification evaluation related to the Marathon control blade issues. c) Please provide the root cause analysis determination related to the Marathon control blade issues. d) Based on the observed failures, please demonstrate that the mechanical lifetime calculations, inputs, and assumptions remain valid for the ESBWR.

4.2-21	Harris C	Are connectors, including the rollers exposed to coolant or other corrosive environments?	Section 2.4 of NEDE-33244P describes the connector. Are connectors, including the rollers depicted in the connector figure, exposed to coolant or other corrosive environments at any time? If so, please demonstrate that materials will not seriously degrade via any relevant processes, such as stress corrosion cracking.
4.2-22	Harris C	Austenitic stainless steels have no inherent age hardening capability and lend themselves readily to the welding process.	Section 3.2.4 of NEDE-33244P states, “Austenitic stainless steels have no inherent age hardening capability and lend themselves readily to the welding process.” Please provide a more detailed basis for this statement.
4.2-23	Harris C	Basis for the irradiated boron carbide swelling predictions	Section 3.6.1 of NEDE-33244P describes the basis for the irradiated boron carbide swelling predictions. a) Is the reactor referenced in this section a commercial LWR? If not, justify the applicability of the swelling data to the ESBWR. b) Provide further documentation of the boron carbide swelling test program.
4.2-24	Harris C	Design changes relative to the original Marathon	Section 2 of NEDE-33244P describes design changes relative to the original Marathon design. It is stated that the ESBWR capsule’s end cap is the same as that used in the 1991 design. In Section 2.2, the capsule walls are said to be thicker than the 1991 design. Please explain why thicker walls are necessary but thicker end caps are not necessary.

4.2-25	Harris C	Capsule length and no additional B_4C powder compaction or settling due to manufacturing	Section 2.3 of NEDE-33244P describes Capsule Length. Therein a statement is made that, “It was shown that there was no additional B_4C powder compaction or settling due to manufacturing, handling or normal operating loads.” The figure 3.7 radiograph indicates variable density within the capsules. a) Please explain the difference between the statement and the radiograph. b) Please verify that increased B_4C density at any sections of the tubes will not result in closure of the gap between capsule and tube. c) Since the ESBWR capsule lengths are longer than those of reference 1, and shorter than those currently used, what is the relevance of the statements referring to the benefits of densification properties for longer rods? d) Please explain how mechanical testing of 36” capsules is applicable to ESBWR capsules, which are a different length. e) Please completely describe the mechanical testing of capsules, and the rationale for applying mechanical tests of longer length capsules to the ESBWR capsule design. Include a description of which, if any, ASTM standards or other acceptable test standards were followed. If none were followed, please provide an explanation of why not and the adequacy of the procedures which were employed.

4.2-26	Harris C	ESBWR Marathon Control Rod surveillance program	Section 5 of NEDE-33244P presents the ESBWR surveillance program. Please update the surveillance program to include more rigorous inspection and notification and to address operating experiences.
4.2-27	Harris C	Marathon-5S Control Rod Assembly is an improvement of the marathon, and that potential problems with the marathon are eliminated by the 5S design	GEH has submitted a topical report, NEDE-33284P, Marathon-5S Control Rod Assembly, to the staff. Throughout that document there are statements that the new design of the marathon 5S is an improvement of the marathon, and that potential problems with the marathon are eliminated by the 5S design. Please explain why each of the suggested 5S design changes is not necessary for those ESBWR specifications which do no vary from the marathon.

DC GE - ESBWR Mailing List (Revised 03/18/2008)

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

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)

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)

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