January 29, 2007

Mr. David Hinds, Manager, ESBWR
General Electric Company
P.O. Box 780, M/C J70
Wilmington, NC 28402-0780

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 90 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 Chapters 6 and 15 of the ESBWR Design Control Document and Chapter 21 of the staff's development of the ESBWR safety evaluation report.

The Chapter 15 questions are based on the most current information provided in GE's submittal dated January 5, 2007. This submittal includes a proposed version of the DCD, Revision 3, Section 15.4, titled, "Proposed ESBWR DCD, Tier 2, Section 15.4, Changes Resulting from the Licensing Topical Report NEDE-33279P ESBWR Containment Fission Product Removal Evaluation Model."

Chapter 6: 6.3-76 and 6.3-77
Chapter 15: 15.4-6 through 15.4-29
Chapter 21: 21.6-101

To support the review schedule, you are requested to respond to this RAI by March 9, 2007.

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

Sincerely,

/RA/

Shawn 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

January 29, 2007

Mr. David Hinds, Manager, ESBWR
General Electric Company
P.O. Box 780, M/C J70
Wilmington, NC 28402-0780

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 905 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 Chapters 6 and 15 of the ESBWR Design Control Document and Chapter 21 of the staff's development of the ESBWR safety evaluation report.

The Chapter 15 questions are based on the most current information provided in GE's submittal dated January 5, 2007. This submittal includes a proposed version of the DCD, Revision 3, Section 15.4, titled, "Proposed ESBWR DCD, Tier 2, Section 15.4, Changes Resulting from the Licensing Topical Report NEDE-33279P ESBWR Containment Fission Product Removal Evaluation Model."

Chapter 6: 6.3-76 and 6.3-77
Chapter 15: 15.4-6 through 15.4-29
Chapter 21: 21.6-101

To support the review schedule, you are requested to respond to this RAI by March 9, 2007.

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

Sincerely,
/RA/

Shawn 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

ACCESSION NO. ML070230300

OFFICE	NGE1/PM	NGE1/BC
NAME	SWilliams	MShuaibi
DATE	01/24/2007	01/29/007

OFFICIAL RECORD COPY

Distribution for DCD RAI Letter No. 90 dated January 29, 2007

Hard Copy
PUBLIC
NGE1 R/F
ACubbage

E-Mail
JDanna
MGravilas
ACRS
OGC
MShuaibi
ACubbage
LRossbach
TKevern
LQuinones
MBarillas
NPatel
JGaslevic
SWilliams
SGreen
IBerrios
MVaalar
JLee
MKotzalas
YDiaz-Castillo
VKlein
RLandry
JStaudenmeier

RAI Number	Reviewer	Question Summary	Full Text
6.3-76	Klein V Stauden meier J	Bounding RPV Level Calculations for MSLB Break	In the DCD Revision 2 Table 6.3-5 the minimum chimney static head for the steam line break inside containment for the cases run with bounding values are higher than those run using the nominal values. Please explain.
6.3-77	Klein V Stauden meier J	Label of "Minimum Chimney Static Head Level Above Vessel Zero Per Active Single Failure" in Table 6.3-5.	In the DCD Revision 2 Table 6.3-5, the label of "Minimum Chimney Static Head Level Above Vessel Zero Per Active Single Failure m (ft)" is misleading since you are only adding the static head in the chimney to the elevation of the bottom of the chimney. Demonstrate that the static head from vessel zero is not different from the values in this table, or revise this label in the next revision of the DCD to more accurately represent what you are calculating.
15.4-6	Lee J	Incorporate the radiological consequence analyses provided in the LTR and the VTT report into the DCD	Please incorporate the radiological consequence analyses provided in (1) General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006," (LTR) and (2) General Electric Research Report No. VTT-R-04413-06, "Estimation and Modeling of Effective Fission Product Decontamination Factor for ESBWR Containment - Part 1, October 2006," (VTT report) into DCD Section 15.4.4, "Loss-of-Coolant Accident Inside Containment Radiological Analysis," or please incorporate these two reports into the DCD Chapter 15 as appendices.
15.4-7	Lee J	Provide and incorporate the radiological consequence analyses for Accident Scenario 2 and Accident Scenario 3 into the LTR and DCD	The General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006," (LTR) includes the radiological consequence analyses, complete with fission product removal rates in the containment for Accident Scenario 1, "Reactor Bottom Drain Line Break - With automatic depressurization system (ADS) (Low Pressure) Scenario." Complete and provide the same radiological consequence analyses, complete with fission product removal rates in the containment and associated pH evaluation for Accident Scenario 2, "Reactor Bottom Drain Line Break - without ADS (High Pressure) Scenario," and Accident Scenario 3, "Loss of Preferred Power," as discussed in Section 1.3, "Accident Scenarios Evaluated" of the LTR. Please incorporate these two remaining radiological consequence analyses into the LTR and Section 15.4.4. Compare and discuss the results of the radiological consequences and fission product removal rates in the containment for Accident Scenarios 1, 2, and 3.

RAI Number	Reviewer	Question Summary	Full Text
15.4-8	Lee J	Rectify inconsistencies in statements concerning the reactor accident source term in the LTR and DCD	Proposed DCD, Tier 2, Revision 3, Section 15.4.4 states that its radiological consequence analyses are based on NUREG-1465 alternative source terms and the methodology in Regulatory Guide (RG) 1.183. However, Section 15.4.4.2.1 states that the core remains covered throughout the accident and there is no fuel damage. This is inconsistent with NUREG-1465 and RG 1.183. Please rectify these inconsistencies in these statements. Review the entire General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) and Section 15.4.4 to ensure that there are no further discrepancies.
15.4-9	Lee J	State the methods used to obtain reactor core fission product inventory and whether the methods used are consistent with the RG 1.183	Proposed DCD, Tier 2, Revision 3, Section 15.4.4.5.1.2 describes the reactor core inventory. Table 15B -1 provides reactor core fission product inventory. Please state the methods (i.e., computer code) used to obtain reactor core fission product inventory, complete with core thermal power, fuel burnup, and fuel enrichment. State whether the methods used are consistent with the guidance provided in Regulatory Guide (RG)1.183, Section 3.1.
15.4-10	Lee J	State whether the MSIV leakage to the turbine building is included in the total containment leakage rate of 0.5 percent per day by volume	Concerning Proposed DCD, Tier 2, Revision 3, Section 15.4.4.5.2, "Radionuclide Releases and Pathways," state whether the main steam isolation valve (MSIV) leakage to the turbine building is included in the total containment leakage rate of 0.5 percent per day by volume.
15.4-11	Lee J	Include the leakage test for meeting the PCCS leakage	Proposed DCD, Tier 2, Revision 3, Section 15.4.4.5.2, "Radionuclide Releases and Pathways," states that "the remaining 2% of primary containment leakage [out of 0.5 percent] is assumed to leak through the [passive containment cooling system] PCCS into the airspace directly above the PCCS and

RAI Number	Reviewer	Question Summary	Full Text
		limit as a TS and ITAAC	[isolation condenser] IC pools. This leakage is quickly vented directly to the atmosphere [bypassing the reactor building enclosure]." The PCCS condensers are an extension of the containment boundary. DCD, Tier 2, Revision 2, Section 6.2.2.2.2 states that "Spectacle flanges are included in the [PCCS condenser] drain line and in the [PCCS condenser] vent line to conduct post-maintenance leakage tests separately from Type A containment leakage tests. (See DCD Figure 6.2-16 in page 6.2-169) Include the leakage test for meeting the PCCS leakage limit (2 percent of L_a) in the ESBWR Technical Specification (TS), and in Tier 1, Table 2.15.4 -1, "ITAAC For The Passive Containment Cooling System."
15.4-12	Lee J	Provide values used for each parameter in estimating natural deposition of elemental iodine in the containment	Proposed DCD, Tier 2, Revision 3, Section 15.4.4.5.2.1 describes removal of elemental iodine from containment. Provide all numerical values used for each parameter in your equation for estimating natural deposition of elemental iodine in the containment.
15.4-13	Diaz-Castillo Y Lee J	Provide a sensitivity analysis of pH to CsOH formation	Proposed DCD, Tier 2, Revision 3, Section 15.4.4.5.2.2 (last paragraph) and Section 4.1.2.1, "Cesium Hydroxide," (CsOH) of the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) discusses the production and formation of CsOH stating that "The cesium that is not in the chemical form of CsI is assumed to exist .... in the form of CsOH." The staff believes cesium may also exist in the form of cesium compounds other than CsOH (i.e., cesium molybdate, cesium manganate). Cesium may enter containment in the form of CsOH, cesium borate or cesium iodide. Although CsOH is highly soluble in water and a strong base, by itself it is not sufficient to maintain pH in the containment pools above 7. Given your statement that pH in the containment pool will remain alkaline due to sufficient amount of CsOH, provide a sensitivity analysis of pH to CsOH formation (zero to 100 percent formation).

RAI Number	Reviewer	Question Summary	Full Text
15.4-14	Lee J	Include the amount of cable insulation in the containment as an ITAAC item	Section 4.1.2.1, "Hydrochloric Acid ,"(HCl) in the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) discusses the production and formation of HCl. The LTR states that the amount of cable insulation material in the containment of the Advanced Boiler Water Reactor is applied to the ESBWR. Please include the amount of cable insulation material in the ESBWR containment in DCD Tier 1 as an ITAAC item.
15.4-15	Lee J	Provide paint specification for paint to be used in the containment surfaces	Section 4.1.2.1, "Hydrochloric Acid ,"(HCl) in the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) discusses the production and formation of HCl. The formation of organic iodides in the containment following a loss-of-coolant accident could result from processes initiated at the surfaces of containment paint. Therefore, please provide paint specification for paint to be used in the containment surfaces.
15.4-16	Lee J	Clarification and editorial comments for the LTR	(A) In the "Abstract" and Section 1.1, "Background," of the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR), revise the current statement " The passive systems are different from those used in current generation BWRs, thus many of the regulations and methodologies used in previous analyses are not directly applicable to the ESBWR design" with "The passive systems are different from those used in current generation BWRs, thus certain regulations (source terms) and methodologies used in previous analyses are not directly applicable to the ESBWR design." (B) In Section 1.1, "Background" of the LTR, delete the following sentence, "This research often led..... based on TID source term." (C) In Section 1.3, "Accident Scenarios Evaluated," of the LTR, revise the word from "credited" to "provided" to read "No active systems, such as safety related containment sprays or Standby Gas Treatment Systems are provided to limit...."

RAI Number	Reviewer	Question Summary	Full Text
15.4-17	Lee J	Describe the three accident scenarios in the LTR in more detail	Section 1.3, “Accident Scenarios Evaluated,” of the General Electric Licensing Topical Report, NEDE-33279, “ESBWR Containment Fission Product Removal Evaluation Model, October 2006,”(LTR), describes three accident scenarios evaluated for the radiological consequence analysis. Describe each of the three accident scenarios in more detail, complete with sequence of events, operation and availability of the engineered safety features systems including the suppression pool, fission product transport pathways, and fission product release timing.
15.4-18	Lee J	Provide a steam flow schematic showing the MSIV alternative leakage pathways	Provide a steam flow schematic diagram in the DCD showing the main steam isolation valve (MSIV) alternative leakage pathways including the four main steam lines, leak rates assumed and specified in the ESBWR technical specifications (TS) for each steam line, all main steam and drain line isolation valves including turbine stop valve, main steam drain lines, main steam drain header, main condensers, low and high pressure turbines, seismic classifications, and fission product release point.
15.4-19	Lee J	Include the steam drain lines must be analyzed to the Safe Shutdown Earthquake (SSE) loading conditions in DCD, Tier 1, Section 2.11.1	Proposed DCD, Tier 2, Revision 3, Section 15.4, states that the main steam lines and steam drain lines are designed to meet Safe Shutdown Earthquake (SSE) criteria and analyzed to dynamic loading criteria. DCD, Tier 1, Revision 2, Section 2.11.1, “Turbine Main Steam System,” under “Design Description” states that, “Turbine MS piping including the steam auxiliary valves(s), from the seismic interface restraint to the main stop and main turbine bypass valves in analyzed to demonstrate structural integrity under the Safe Shutdown Earthquake (SSE) loading conditions.” Please explain why steam drains lines were not included or include that steam drain lines must also be analyzed to the Safe Shutdown Earthquake (SSE) loading conditions in DCD, Tier 1, Section 2.11.1, “Turbine Main Steam System,” under “Design Description.”

RAI Number	Reviewer	Question Summary	Full Text
15.4-20	Lee J	Provide additional information concerning the main steam lines	The General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR), Appendix A, "LOCA Dose Assumptions," note 2, states that main steam line and main steam drain line data are not provided because fission product deposition in these lines are not credited. To perform an independent confirmatory radiological consequence analysis on this release pathway, the staff needs following information: (1) main steam pipe diameter, length (horizontal), and volume between MSIVs, drain line valves, and drain line header to the condensers, (2) outside diameter and thickness for the main steam lines, main steam drain lines, steam drain header to the condensers, (3) insulation thickness, and (4) steam pressure and temperature in the main steam lines, steam drain lines, steam drain header to the condensers.
15.4-21	Lee J	Revise the DCD, Tier 1, Section 2.11.7, to include that the MC must be analyzed to the SSE loading conditions	Section 4.4, "Main Steam Isolation Valve Leakage," of the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) states that the condensers are designed to meet the safe shutdown earthquake (SSE) requirements of the boiling water reactors owners group (BWROG) methodology. DCD, Tier 1, Revision 2, Section 2.11.7, "Main Condenser," under "Design Description" states that "the [main condenser] MC is classified as nonsafety-related. However, the supports and anchors for the MC are designed to withstand a safe shutdown earthquake [SSE]." Please explain the discrepancy. If necessary, revise the DCD, Tier 1, Section 2.11.7, "Main Condenser," under "Design Description" to include that the MC must also be analyzed to the SSE loading conditions.
15.4-22	Lee J	Provide the model, methods, and assumptions used for fission product removal in the main condensers	Proposed DCD, Tier 2, Revision 3, Table 15.4-5, "Loss-of-Coolant Accident Parameters," shows the fraction of condenser volume involved in iodine removal as 20 percent and the iodine removal factors as 99.5%. Please provide the model, methods, and assumptions used for fission product removal in the main condensers and justify the use of TID-14844 source term for this pathway for estimating its radiological consequences. Provide an estimated condenser vertical and horizontal surface areas available for aerosol deposition.

RAI Number	Reviewer	Question Summary	Full Text
15.4-23	Lee J	Include in DCD, Tier 1, Section 2.11.1, that the steam drain valves will be equipped with reliable power sources or designed to fail to the required position on loss of power or air	In your response dated December 15, 2006 (MFN 06-514) to the staff's RAI 10.3-10, you stated that the steam drain valve(s) that are required to change position to provide the main steam isolation valve (MSIV) leakage path to the main condenser will be equipped with reliable power sources or designed to fail to the required position on loss of power or air. (A) DCD, Tier 1, Section 2.11.1, "Turbine Main Steam System," under "Design Description" states " the [turbine main steam system] TMSS closes the steam auxiliary (SA) valves on a MSIV isolation signal. These valves fail closed on loss of electrical power to the valve actuation solenoid or on loss of pneumatic pressure." Please clarify if these two statements are the same. If not, include this requirement in the DCD, Tier 1, Section 2.11.1, "Turbine Main Steam System," under "Design Description." (B) Clarify whether your analysis addressed a single failure of one of the MSIVs.
15.4-24	Lee J	Explain how fission product release timing was determined and used in the LTR and DCD	Section 4.4, "Main Steam Isolation Valve Leakage," of the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) and Section 5.0, "Offsite Dose Calculations" stated that "fuel damage does not occur until ....." This is contrary to the guidance provided in RG 1.183 alternative source term (AST). Explain how fission product release timing for the radiological consequence analyses was determined and used throughout the LTR and Section 15.4.4 of the proposed DCD, Tier 2, Revision 3.
15.4-25	Lee J	Please explain discrepancies between statements concerning PCC condenser leakage	Section 4.5, "Containment and Reactor Building Leakage Paths," of the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) states that "any leakage [steam/air/water mixture] from the [passive containment cooling] PCC condensers will be included in the overall containment leakage term (for the radiological consequence analyses)." The next sentence states that "liquid leakage from the PCC condensers and associated piping is not considered....." Please explain the discrepancies. The staff believes any volatile fission products in the liquid leakage will leak from the reactor building to the environment.

RAI Number	Reviewer	Question Summary	Full Text
15.4-26	Lee J	Provide the flow paths used to verify the leak rate and include the leakage rate as a TS and ITAAC	Section 4.5, "Containment and Reactor Building Leakage Paths," of the General Electric Licensing Topical Report, NEDE-33279, "ESBWR Containment Fission Product Removal Evaluation Model, October 2006,"(LTR) stated that your radiological consequence analysis assumed an overall reactor building leakage rate of 50 percent per day. (A) Provide the flow paths to be isolated and the method to be used to verify the leak rate. (B) State whether the leakage rate test to meet the 50 percent per day limit is specified in the ESBWR Technical Specification (TS). (C) Include this leak rate verification in Tier 1 as an ITAAC item to be confirmed at the COL stage. Section 6.2.3.1 "Design Bases," stated that "The RB is capable of periodic testing to assure that the leakage rates assumed in the radiological analyses are met."
15.4-27	Lee J	Provide the design changes and TS revisions to the EBAS system	Staff is aware of possible design changes that include the EBAS system. Please state whether the design changes and TS revisions are complete. Please provide the design changes made to ensure control room habitability meets GDC 19 dose acceptance criteria.
15.4-28	Diaz-Castillo Y	A review of the VTT report indicated it did not provide complete information on iodine transport and distribution in the containment	In order to complete its evaluation, the staff needs to review the general assumptions and calculations used to prove that the containment sump pH will be maintained above 7 for 30 days following a loss-of-coolant accident (LOCA). (A) Please provide this information by completing the attached table (see below) for each pool in the ESBWR design (Reactor Pressure Vessel, Lower Dry Well, Gravity Driven Cooling System, and Wet Well) in sufficient detail for the staff to perform independent calculations. (B) In addition to completing the table for each pool, please complete the attached table for each different pH cases A through F as presented in General Electric Research Report No. VTT-R-04413-06, "Estimation and Modeling of Effective Fission Product Decontamination Factor for ESBWR Containment - Part 1, October 2006."

<table>
<tr><th>RAI Number</th><th>Reviewer</th><th>Question Summary</th><th>Full Text</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Time (hrs)</th><th>V (L)</th><th>HCl (g-mol/L)</th><th>HNO3 (g-mol/L)</th><th>CsOH (g-mol/L)</th><th>Sodium Pentaborate (g-mol/L)</th><th>pH</th></tr>
<tr><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>12</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>24</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>48</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>72</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>96</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>120</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>200</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>300</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>400</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>500</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>600</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>700</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>720</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

(C) In addition, please discuss the injection time of the buffer solution (sodium pentaborate) and its distribution from the moment it is injected to the time of 30 days after the accident.
</td></tr>
<tr><td>15.4-29</td><td>Lee J</td><td>Explain the iodine transport phenomena in the containment and perform a rate analysis of steady state iodine transport</td><td>General Electric Research Report No. VTT-R-04413-06, “Estimation and Modeling of Effective Fission Product Decontamination Factor for ESBWR Containment - Part 1, October 2006,” (VTT report) Section 3, “Goal,” stated that “The purpose of this work is to investigate the capacity of [passive containment cooling system] PCCS condenser to remove airborne fission products from the containment atmosphere.” The report concluded in Section 1, “Executive Summary,” stating that “Both the experimental and modeling result suggest that [aerosol] deposition by diffusiophoresis could remove as much as 50 percent of particles from the gas flow. However, aerosol did not accumulate to the heat exchanger. In all experiments condensed water rinsed deposited particles from the tube walls.....” Therefore, GE’s analysis implicitly assumed that the PCCS drove the iodine in aerosol form into the condensate and that it never came out of the solution with basic pH.

Explain the iodine transport phenomena in the containment and perform a rate analysis of steady state iodine transport within the containment including iodine re-volatilization (iodine production) from the melted fuel in the intact reactor pressure vessel and iodine removal by the PCCS condensers (iodine sink).</td></tr>
</table>

RAI Number	Reviewer	Question Summary	Full Text
21.6-101	Klein V	TRACG04 Prediction of Dry Well Annulus Temperature for GIRAFFE GS1 Test	During the audit of TRACG04 for ESBWR loss of coolant accident analyses, the staff viewed comparisons between data and TRACG04 for the GIRAFFE GS1 test from the TRACG04 Software Test Report (eECPER 0000-0009-7157-00). The results show significant differences between TRACG02 and TRACG04. TRACG04 under predicts the dry well annulus temperature by approximately 60K for long durations. The staff was unable to locate information on this comparison in the TRACG04 ESBWR qualification that has been submitted to the NRC ("Update of ESBWR TRACG Qualification for NEDC-32725P and NEDC-33080P Using the 9-Apr-2004 Program Library Version of TRACG04," MFN 04-059, June 6, 2004). Please explain these differences.

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
seitzjk@nuclear.energy.gov or
seitzjk@id.doe.gov
Frostie.white@ge.com
David.piepmeyer@ge.com
george.stramback@gene.ge.com
wayne.marquino@ge.com
james.kinsey@ge.com
david.lewis@pillsburylaw.com
paul.gaukler@pillsburylaw.com
john.o'neill@pillsburylaw.com
matias.travieso-diaz@pillsburylaw.com
maria.webb@pillsburylaw.com
roberta.swain@ge.com
cwaltman@roe.com
jim.kinsey@ge.com
frank_quinn@comcast.net