



GE Energy

Proprietary Notice

This letter forwards proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 2, the balance of this letter may be considered non-proprietary.

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MFN 07-198

Docket No. 52-010

April 19, 2007

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: **Response to Portion of NRC Request for Additional Information
Letter No. 90 Related to ESBWR Design Certification Application
Safety Analysis – RAI Numbers 15.4-18, 15.4-19, 15.4-23 and 15.4-27**

Enclosure 2 contains proprietary information as defined in 10CFR2.390. The affidavit contained in Enclosure 3 identifies the information contained in Enclosure 2 has been handled and classified as proprietary to GE. GE hereby requests that the proprietary information in Enclosure 2 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. Enclosure 2 is a proprietary Schematic Diagram for ESBWR Main Steam Line Break Leakage Path. A non-proprietary version of this schematic is not available since the information is entirely proprietary and would result in a blank page if provided as a public version enclosure.

If you have any questions or require additional information regarding the information provided here, please contact me.

Sincerely,

James C. Kinsey
Project Manager, ESBWR Licensing

D068

Reference:

1. MFN 07-084, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 90 Related to ESBWR Design Certification Application*, January 30, 2007

Enclosures:

1. MFN 07-198– Response to Portion of NRC Request for Additional Information Letter No. 90 – Safety Analysis – RAI Numbers 15.4-18, 15.4-19, 15.4-23 and 15.4-27
2. MFN 07-198– Response to Portion of NRC Request for Additional Information Letter No. 90 – Safety Analysis – RAI Numbers 15.4-18, 15.4-19, 15.4-23 and 15.4-27 – Schematic Diagram for ESBWR Main Steam Line Break Leakage Path
3. Affidavit – James C. Kinsey – dated April 19, 2007

cc: AE Cubbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
RE Brown GE/Wilmington (with enclosures)
eDRF 0066-4387 for RAI 15.4-18
0065-6373 for RAIs 15.4-19 and 15.4-23
0065-4614 for RAI 15.4-27

Enclosure 1

MFN 07-198

**Response to Portion of NRC Request for
Additional Information Letter No. 90
Related to ESBWR Design Certification Application**

Safety Analysis

RAI Numbers 15.4-18, 15.4-19, 15.4-23, and 15.4-27

NRC RAI 15.4-18:

Full Text: 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.

GE Response:

ESBWR Radiological Analysis was submitted under LTR NEDE-33279 and includes several figures to describe the leakage release path models used to determine dose consequences. The schematic diagram of the steam system release path requested, which overlaps several systems, is an appropriate LTR addition to relate the model description to the plant design. The attached schematic diagram illustrates the leak path as requested. A current LTR figure is shown for a comparison. Insulation requirements for the steam lines drain lines, and power cycle components of the ESBWR will be similar to those of the ABWR certified design.

Affected Documents:

No DCD changes will be made in response to this RAI.

LTR NEDE-33279P, Revision 0, will be revised by August 30, 2007 to incorporate a figure similar to the proprietary schematic diagram provided in Enclosure 2.

NRC RAI 15.4-19:

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."

GE Response:

Revision 3 of DCD Tier 2, Section 15.4, now states, "The main steamlines and drain lines are designed to meet SSE criteria and analyzed to dynamic loading criteria."

Revision 3 of DCD Tier 2, Subsection 10.3.1 includes the following additional wording: "The MSIV fission product leakage path to the main condenser is analyzed to demonstrate structural integrity under SSE loading conditions."

For consistency between DCD Tier 1 and Tier 2, and to validate the alternate leakage control methods outlined in GE Proprietary Report NEDC-31858P, "BWROG Report for Increasing MSIV Leakage and Elimination of Leakage Control Systems," Rev. 2, the Design Description in DCD Tier 1, Revision 3, Subsection 2.11.1, "Turbine Main Steam System," includes the following additional wording: "The MSIV fission product leakage path to the main condenser is analyzed to demonstrate structural integrity under Safe Shutdown Earthquake (SSE) loading conditions."

In addition, an ITAAC Item 5 was added to Table 2.11.1-1. The ITAAC requires the Turbine Main Steam System piping and MSIV fission product leakage path to be able to withstand a SSE without loss of structural integrity. Furthermore, Table 2.11.1-1, Item 6, requires an inspection of the as-built system to verify that non-seismic SSC's will not compromise the structural integrity of the main steamline fission product leakage path.

Affected Documents:

No DCD changes will be made in response to this RAI.

NRC RAI 15.4-23:

Question Summary: 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

Full Text: 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.

GE Response:

(Item A)

The GE Proprietary Report NEDC-31858P, "BWROG Report for Increasing MSIV Leakage and Elimination of Leakage Control Systems," Rev. 2, Section 6.1.1(3), requires that drain valves which are required to open to establish the preferred MSIV leakage path, "... must be capable of being opened even if off-site power is not available."

The response to RAI 10.3-10 (MFN 06-514 dated December 15, 2006) states that the required valves will be equipped with reliable power source(s) or designed to fail to the required position on loss of power or air. This design criterion meets the intent of the above referenced NEDC-31858P.

DCD Tier 2, Revision 3, Subsection 10.3.1.1 includes the response to RAI 10.3-10. In order to clarify the requirements for MSIV leakage path drain valve(s) and maintain consistency with DCD Tier 2, Revision 3, DCD Tier 1, Subsection 2.11.1, now includes a TMSS function in bullet (5) to paragraph 2:

"Opens the drain valve(s) on an MSIV isolation signal that are required to change position to provide the MSIV leakage path to the main condenser. The required drain valve(s) are equipped with reliable power sources or designed to fail to the open position on loss of electrical power to the valve actuating solenoid or on loss of pneumatic pressure."

(Item B)

The GE Proprietary Report NEDC-31858P, "BWROG Report for Increasing MSIV Leakage and Elimination of Leakage Control Systems," Rev. 2, Section 4.3.3(1), states, "In accordance with

the single active-failure requirements, one MSIV in one line remains open after containment isolation.”

The dose analysis in Licensing Topical Report (LTR) NEDE-33279P, “ESBWR Containment Fission Product Removal,” Rev. 0, does not specifically consider the failure of a single MSIV to close on an MSIV isolation signal. However, the above calculation conservatively assumes the combined maximum MSIV leakage rate of 200 scfh at the time of MSIV isolation. The assumed maximum leakage rate bounds the worst-case leakage for failure of a single MSIV to close. In addition, Technical Specification surveillance requirement (SR) 3.6.1.3.8 provides continued monitoring of the actual MSIV leakage rate.

Affected Documents:

No DCD changes will be made in response to this RAI.

NRC RAI 15.4-27:

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.

GE Response:

The EBAS is no longer applicable to the ESBWR design. Section 6.4, Subsection 9.4.1 and Chapter 16 (Technical Specifications) have been revised to reflect the elimination of the EBAS. The Technical Specification revisions are complete and are reflected in DCD Revision 3 that describes the ESBWR control room habitability compliance with GDC 19.

Affected Documents:

DCD Tier 2, Section 6.4, Subsection 9.4.1 and Chapter 16 (Technical Specifications) were revised in DCD Revision 3. There are no DCD changes as a result of this RAI.

Enclosure 3

MFN 07-198

Affidavit

General Electric Company

AFFIDAVIT

I, **James C. Kinsey**, state as follows:

- (1) I am Project Manager, ESBWR Licensing, General Electric Company ("GE") have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in Enclosure 2 of GE letter MFN 07-198, Mr. James C. Kinsey to U.S. Nuclear Regulatory Commission, *MFN 07-198 – Response to Portion of NRC Request for Additional Information Letter No. 90 – Safety Analysis – RAI Numbers 15.4-18, 15.4-19, 15.4-23, and 15.4-27* dated April 19, 2007. The proprietary information is in Enclosure 2 "Schematic Diagram for ESBWR Main Steam Line Break Leakage Path for RAI Number 15.4-18", *MFN 07-198 – Response to Portion of NRC Request for Additional Information Letter No. 90 – Safety Analysis – RAI Numbers 15.4-18, 15.4-19, 15.4-23, and 15.4-27– GE Proprietary Information* is delineated by a [[dotted underline inside double square brackets.^{3}]]. Figures and large equation objects are identified with double square brackets before and after the object." In each case, the superscript notation ^{3} refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.
- (3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), and 2.790(a)(4) for "trade secrets" (Exemption 4). The material for which exemption from disclosure is here sought also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of proprietary information are:
 - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;
 - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

- c. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, resulting in potential products to General Electric;
- d. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a., and (4)b, above.

- (5) To address 10 CFR 2.390 (b) (4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- (8) The information identified in paragraph (2), above, is classified as proprietary because it identifies detailed GE ESBWR design information for the Nuclear Boiler System. GE utilized prior Nuclear Boiler System design information and experience from its fleet with significant resource allocation in developing the system over several years at a cost of over one million dollars.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's

comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

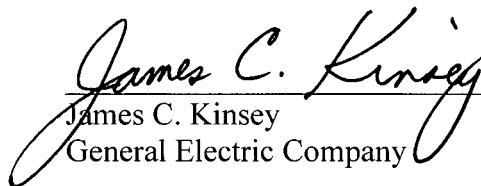
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 19th day of April 2007.


James C. Kinsey
General Electric Company