



GE Energy

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Proprietary Notice

This letter forwards proprietary information in accordance with 10CFR2.390. Upon the removal of Enclosure 1, the balance of this letter may be considered non-proprietary.

MFN 07-168

Docket No. 52-010

March 29, 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. 66 Related to ESBWR Design Certification Application –
TRACG Application – RAI Number 21.6-55**

Enclosure 1 contains proprietary information as defined in 10CFR2.390. The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GE. GE hereby requests that the proprietary information in Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. A non proprietary version is contained in Enclosure 2.

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

Reference:

1. MFN 06-377, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application*, October 10, 2006

Enclosures:

1. MFN 07-168 – Partial Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – TRACG Application – RAI Number 21.6-55 – GE Proprietary Information
2. MFN 07-168 – Partial Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – TRACG Application – RAI Number 21.6-55 – RAI Response – Non-Proprietary
3. Affidavit – David H. Hinds – dated March 29, 2007

cc: AE Cabbage USNRC (w/enclosures)
GB Stramback GE/San Jose (w/enclosures)
BE Brown GE/Wilmington (w/enclosures)
eDRF 0058-1439

Enclosure 2

MFN 07-168

**Response to Portion of NRC Request for
Additional Information Letter No. 66
Related to ESBWR Design Certification Application**

TRACG Application

RAI Number 21.6-55

Non-Proprietary Version

NRC RAI 21.6-55

Provide the following additional information regarding the modeling of the isolation condenser using the TRACG code:

A. Explain in detail how the isolation condenser is modeled. Provide a nodalization diagram illustrating which components are used. How is this different from the isolation condenser model used in the PANTHERS test discussed in Section 4.2 of NEDC-32725P "TRACG Qualification for SBWR"?

B. Provide a discussion of how noncondensable gas generated by radiolytic water decomposition is treated during an event that requires the isolation condenser system (ICS). Is radiolytic noncondensable gas modeled using TRACG? If so, explain what uncertainties are included in the timing of the transport of the radiolytic noncondensable gas to the ICS. Comparison of TRACG calculations to PANTHERS data shows significant differences in the transport timing. If this is not included in the TRACG model, explain how the treatment in the TRACG modeling is conservative.

GE Response

Table 1 shows a comparison of the PANTHERS, LOCA, and AOO/ATWS model. The component representing the steam line from the vessel to the IC steam header [[
]] is modeled in the system. Also, in the AOO model the IC tubes are modeled [[

]]. The way that the heat is transferred to the pool is [[
]] model because of the nature of the transient.

Appendix A and Appendix B contain sketches of the LOCA and AOO/ATWS IC system nodalization, respectively. Appendix C contains the PANTHERS nodalization diagram from Figure 4.2-3 of NEDC-32725P.

Table 1. Comparison of Components

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Noncondensable gas from radiolysis is modeled in TRACG LOCA calculations by a [[]] component connected to the vessel that, [[]]. The gas injection velocity is determined from analysis done by radiological/fuel engineering. During the modeled transient, the gasses that accumulate in the IC system lower header [[]]

Radiolytic gas generation is not modeled in the AOO analysis because the IC is vented during normal operation, and the AOO analysis duration is too short to degrade IC performance.

It is postulated that the primary reason for the differences in the calculated and measured pressure transients (timing of gas transport) [[]]

instant, [[]] Accordingly, at any

]] TRACG does not model gas solution and it is likely that the simple one-dimensional modeling of the lower header in the TRACG simulation causes an under calculation of the gas entrainment mechanism. NEDC-32725P Revision 1, Section 4.2.6.2.1 describes these PANTHERS post-test simulation findings.

Also, it should be noted that one purpose of the PANTHERS-IC test program was to demonstrate that the designed vent system could perform its intended function and remove radiolytic noncondensable gases that could build up in the condenser. During those tests, the gases were [[]] into the condenser [[]] such that the inlet pressure had increased to a preset value or the inlet pressure stopped increasing. [[]]

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Affected Documents

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

No changes to the subject LTR will be made in response to this RAI.

Appendix A: LOCA IC System Nodalization

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Appendix B: AOO/ATWS IC System Nodalization

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Appendix C: PANTHERS IC System Nodalization

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Enclosure 3

MFN 07-168

Affidavit

General Electric Company

AFFIDAVIT

I, David H. Hinds, state as follows:

- (1) I am Manager, New Projects Engineering, General Electric Company ("GE") and 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 1 of GE letter MFN 07-168, James C. Kinsey to NRC, *Partial Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – TRACG Application – RAI Number 21.6-55* dated March 29, 2007. The proprietary information in Enclosure 1, *Partial Response to Portion of NRC Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application – TRACG Application – RAI Number 21.6-55* is delineated by a double underline inside double square brackets. 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 contains GE tests and experiments that constitutes a major GE asset along with the interpretation and application of the analytical results. The computer code used to assess Anticipated Transient Without Scram and Abnormal Operational Occurrences was developed at considerable cost to GE in the millions of dollars and represents a significant 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 29th day of March 2007.



David H. Hinds
General Electric Company