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Project 717

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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20852-2738

Attention: Chief, Information Management Branch
Program Management
Policy Development and Analysis Staff

Subject: **Additional Information on ESBWR Core Design – PANACEA Output Files**

In response to a request from the NRC regarding the PANACEA output files previously provided in the Referenced letter, GE is providing Enclosure 1, which includes data files on a CD and text describing the files. Data in the following areas is provided:

- Core Wide Doppler Feedback Coefficient
- Void and Control Rod History for Each Neutronics Node
- Axial Lengths of Nodes
- Three Dimensional Power Distribution
- Orifice Loss Coefficient for Peripheral and Central Locations
- Core Wide Void Coefficient via Inlet Flow Perturbation

Enclosure 1 contains GE proprietary information as defined by 10 CFR 2.390. A non-proprietary version is provided in Enclosure 2. The data files on the CD included with Enclosure 1 are entirely proprietary and a non proprietary version is not available. GE customarily maintains this information in confidence and withholds it from public disclosure.

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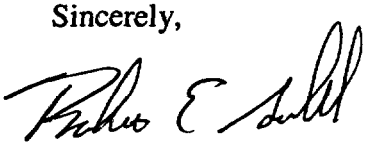
The affidavit contained in Enclosure 3 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GE. GE hereby requests that the information of Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 9.17. If you have any questions about the information provided here, please let me know.

Sincerely,



Robert E. Gamble
Manager, ESBWR

Reference:

MFN 04-071, Letter from Robert E. Gamble to U.S. Nuclear Regulatory Commission, *ESBWR Core Design – PANACEA Output Files*, July 14, 2004

Enclosures:

1. MFN 04-077 – Additional Information - PANACEA Output Files - GE Proprietary Information
2. MFN 04-077 – Additional Information - PANACEA Output Files – Non Proprietary
3. Affidavit, George B. Stramback, dated August 9, 2004

cc: AE Cubbage USNRC (with enclosures)
JE Lyons USNRC (w/o enclosures)
WD Beckner USNRC (w/o enclosures)
GB Stramback - GE (with enclosures)
eDRF 0000-0031-4990

ENCLOSURE 1

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Additional Information – PANACEA Output Files

GE Company Proprietary

PROPRIETARY INFORMATION NOTICE

This enclosure contains proprietary information of the General Electric Company (GE) and is furnished in confidence solely for the purpose(s) stated in the transmittal letter. No other use, direct or indirect, of the document or the information it contains is authorized. Furnishing this enclosure does not convey any license, express or implied, to use any patented invention or, except as specified above, any proprietary information of GE disclosed herein or any right to publish or make copies of the enclosure without prior written permission of GE. The header of each page in this enclosure carries the notation "GE Proprietary Information."

GE proprietary information is identified by a double underline inside double square brackets. [[This sentence is an example.{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 the affidavit provided in Enclosure 3, which documents the basis for the proprietary determination. Specific information that is not so marked is not GE proprietary.

ENCLOSURE 2

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Additional Information – PANACEA Output Files

MFN 04-077
Enclosure 2

Introduction

To support the NRC during the remodeling of the current ESBWR design, additional information has been requested. In order to best support this request, electronic files are provided to support the extraction of these large datasets. While the Panacea simulation needed to be rerun in order to obtain the additional information to be written to the output files, comparisons to the original run indicate that there are no numerical changes between the runs.

The data files are contained on the enclosed CD and are summarized below.

Core Wide Doppler Feedback Coefficient

The core wide Doppler Feedback coefficients are located in the "ARK" edits of the Niter 14 runs. The following table summarizes the coefficients for BOC, MOC, and EOC exposure points.

	Doppler Feedback Coefficient (dk/k)/(delta deg K)
BOC	[[ ]]
MOC	[[ ]]
EOC	[[ ]]

Void and Control Rod History for Each Neutronics Node

Per discussion with the NRC it was concluded that the requirement could be satisfied by providing the "Nodal History Relative Water Density" values (otherwise known as Panacea parameter "UH"). This data is a three-dimensional array for each exposure point. Consequently, the data will be provided in ASCII file format. The following table identifies the appropriate filenames for the intended data.

	"UH" Filenames
BOC	**COPY_BOC_UH.TXT**
MOC	**COPY_MOC_UH.TXT**
EOC	**COPY_EOC_UH.TXT**

Axial Lengths of Nodes

During the modeling of the Panacea simulations, the number of axial nodes was chosen to be [[ ]] (Panacea parameter "MKC"). Because the active fuel length for the ESBWR is [[ ]], this creates a uniform axial node length of [[ ]] (Panacea parameter "DELTZI").

Three Dimensional Power Distribution

The normalized nodal power distributions are known as parameter "P" in Panacea. This data is a three-dimensional array for each exposure point. Consequently, the data will be provided in ASCII file format. The following table identifies the appropriate filenames for the intended data.

	"P" Filenames
BOC	**COPY_BOC_P.TXT**
MOC	**COPY_MOC_P.TXT**
EOC	**COPY_EOC_P.TXT**

Orifice Loss Coefficient for Peripheral and Central Locations

Consistent with previous GE BWR plant designs, the loss coefficients are different between the peripheral and central locations. Based on most recent estimates, the peripheral loss coefficient was chosen to be [[ ]] and the central loss coefficient was chosen to be [[ ]]. It is recognized that these differ from the loss coefficients originally modeled in the reference ESBWR design. However, evaluation of the differences indicates that reactivity and thermal limit results are essentially identical. Pressure drop estimates across the core are now estimated to be approximately [[ ]] higher than identified in this reference ESBWR design. Locations between the peripheral locations (defined as "2") and the central locations (defined as "1") can be found in filename "**COPY_ALL_IBORF.TXT**".

Core Wide Void Coefficient via Inlet Flow Perturbation

In order to obtain the core wide void coefficient via inlet flow perturbation NITER 14 cases were prepared and run from the appropriate BOC, MOC, and EOC starting point. The following table identifies the values for each exposure point.

	Core Wide Void Coefficient (dk / delta % voids * k)
BOC	[[ ]]
MOC	[[ ]]
EOC	[[ ]]

ENCLOSURE 3

MFN 04-077

Affidavit

General Electric Company

AFFIDAVIT

I, George B. Stramback, state as follows:

(1) I am Manager, Regulatory Services, 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 04-077, Robert E. Gamble to NRC, *Additional Information on ESBWR Core Design – PANACEA Output Files,* dated August 9, 2004. The proprietary information is in Enclosure 1, *Additional Information – PANACEA Output Files.* Enclosure 1 also contains a CD which is entirely proprietary. For text and text contained in tables, GE proprietary information is identified 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 2.390(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 details specific information regarding application of TRACG to the ESBWR core design. This TRACG code has been developed by GE for over fifteen years, at a total cost in excess of three million dollars. The reporting, evaluation and interpretations of the results, as they relate to the ESBWR, was achieved at a significant cost to GE.

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 9th day of August 2004

George B. Stramback
General Electric Company