

Enclosure 2

MFN 08-610

**Presentation Slides Prepared for DCD, Revision 5,
Chapter 8 Audit on July 29, 2008**

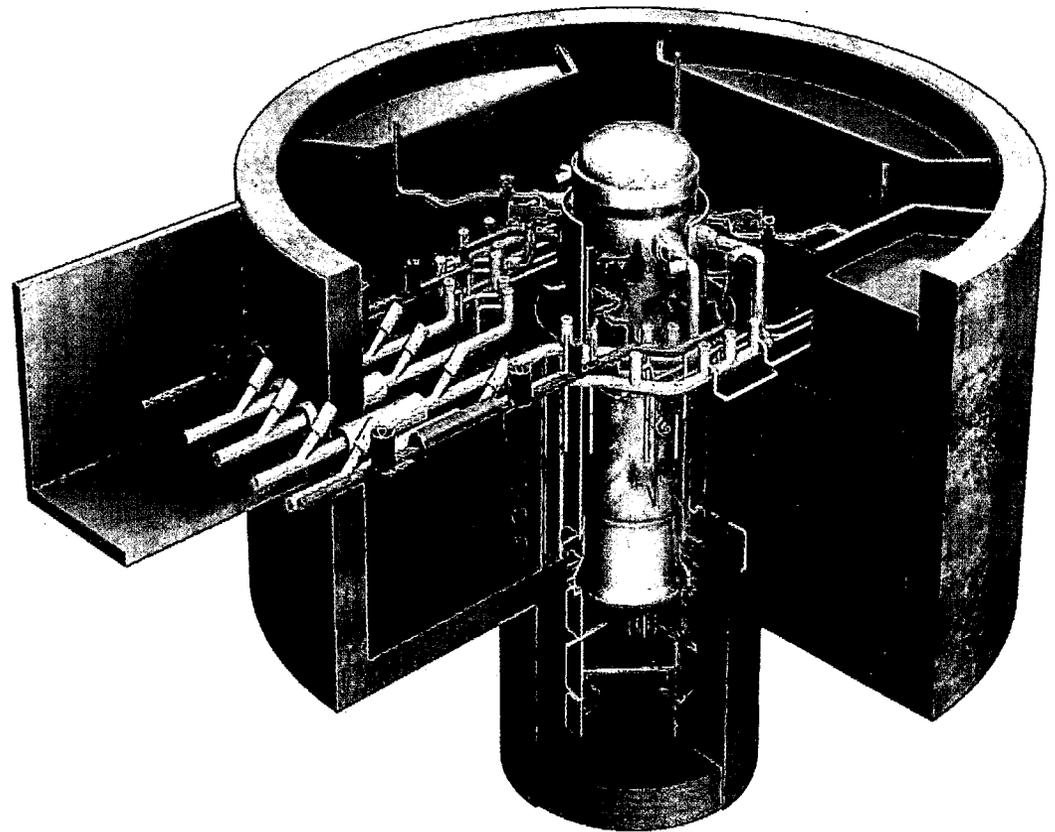
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ESBWR DCD Rev. 5 Chapter 8

Electrical Power

NRC Audit



July 29, 2008

GE Hitachi Nuclear Energy

Introduction

■ Presenters

- Don Lewis, ESBWR Regulatory Affairs
- Jack Silver, ESBWR Engineering
- John Stryhal, ESBWR Engineering Chapter 8 Lead Chapter Engineer (Remote)
- John Rucki, ESBWR Engineering
- Russ Cussick, ESBWR Engineering (Remote)

Audit Agenda

- Chapter 8 RAIs (Open Items)
- Review of Safety Related Battery Load calculation/spreadsheet
- Status of Safety Related Batteries
- Discussion of Ancillary Diesel modification and NRC questions
- Plan / Schedule Future Meetings
- Summary/ Informal Discussion Period

Chapter 8, RAIs

- Chapter 8 – The following RAIs are currently the only remaining RAIs on Ch. 8
 - > 8.3-52 S03, S04 – Safety-Related Battery Load Calculation
 - > 8.2-14 – Overvoltage Issues

RAI Response 8.3-52 S03, S04 - Battery Load Calculation

- Presented by Jack Silver

RAI Response 8.2-14 - Overvoltage Issues

- Presented by John Stryhal and Russ Cusick

Status of Safety Related Batteries

- Presented by John Stryhal and John Rucki

Ancillary Diesels Status

- Presented by John Stryhal and John Rucki

Ancillary Diesels NRC Q&A

- Presented by John Stryhal and John Rucki
- Ancillary diesel generator provides AC power to the loads after 72 hours in the event of the station black-out.
- 1. When and how to start the diesel generator?
- 2. When and how to close the safety-related isolation devices (two safety-related circuit breakers in series) to power the UPS?
- 3. How to synchronize the two different power supplying systems?

Ancillary Diesels NRC Q&A (continued)

- 4. In the event of the faults on ancillary DG 480V buses and the regulating transformer, how to isolate the faults (ground fault, short circuit fault, overload, undervoltage, etc);
- 5. Alarms and Indications of the ancillary diesel generator.

Plan /Schedule for Future Meetings

- During the week of 10/6/08, GEH would like to hold a information sharing meeting with NRC, Battery vendors, and others to share information GEH has found on VLA/VRLA Battery qualification and technology.

Summary

- Chapter 8 provides the design basis of the electrical power systems.
- Battery Loads are derived from a calculation that meets NRC expectations.
- All Open RAIs are currently answered, (except for and new ones on ancillary diesels)

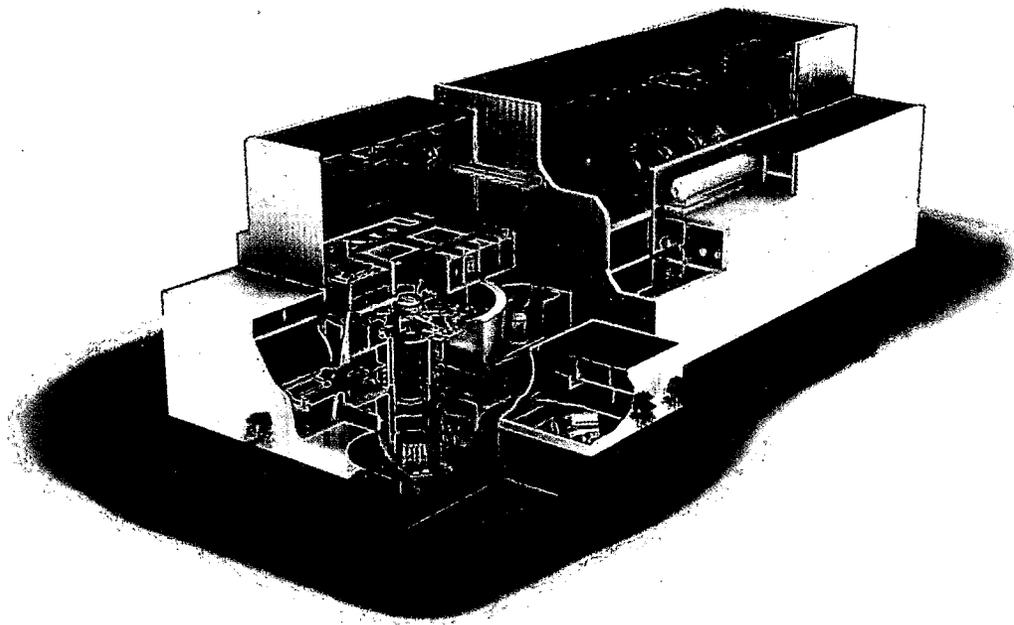
Informal Discussion Topics

- ESBWR DCD R5, Chapter 8 provides design basis of the electrical power systems.
- What is left for GEH to do to support NRC on Chapter 8 SER?
- GDC 17 issue

GE Hitachi ESBWR 250V Safety Related Battery Calculation

GEH: Don Lewis and Jack Silver

June 29, 2008



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Overview of Safety Related DC Power Supply

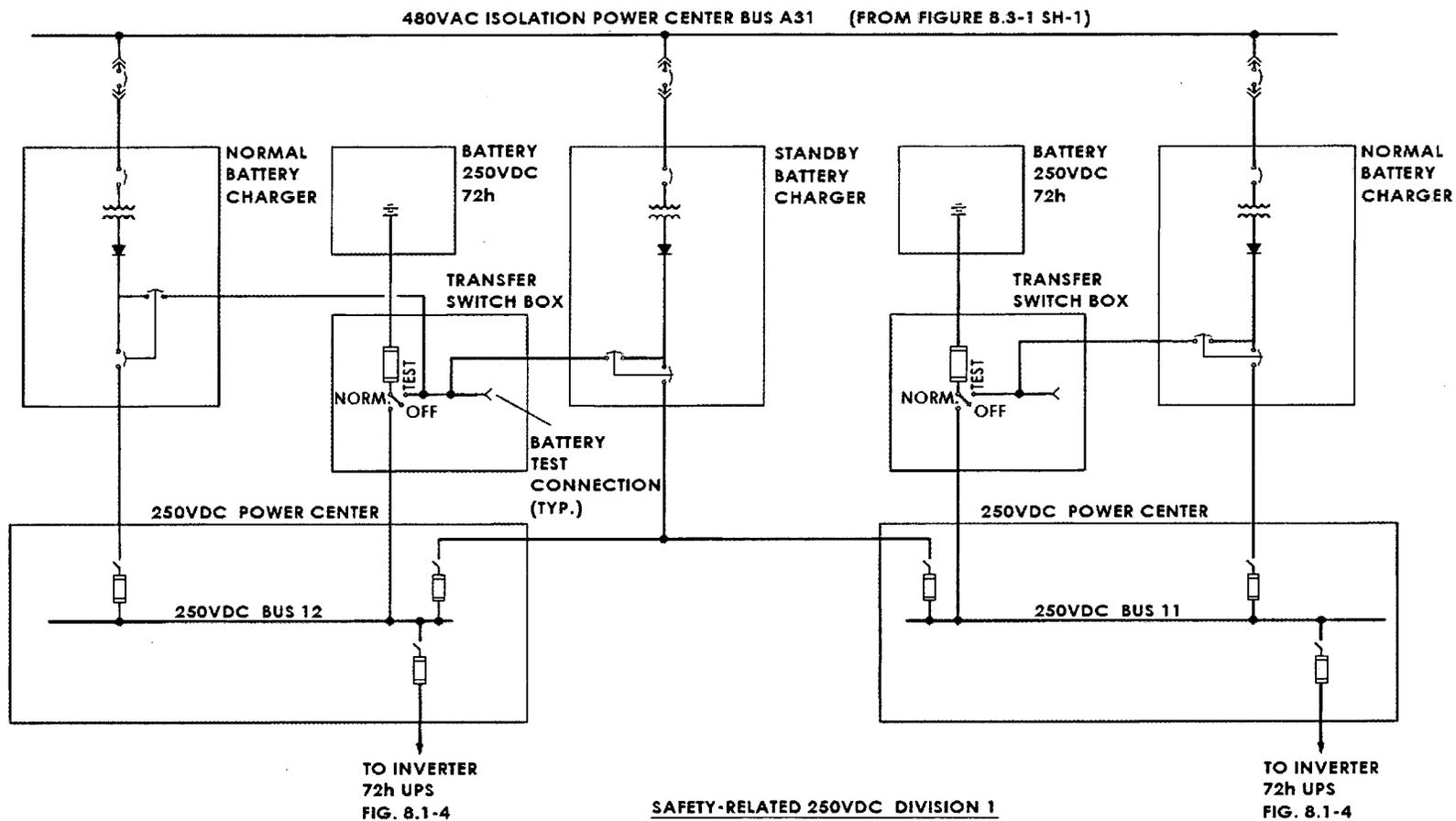
2 – 250 VDC Batteries Per Division

Feed Inverters Whose Outputs Are Tied Together To Supply Each Divisional Load



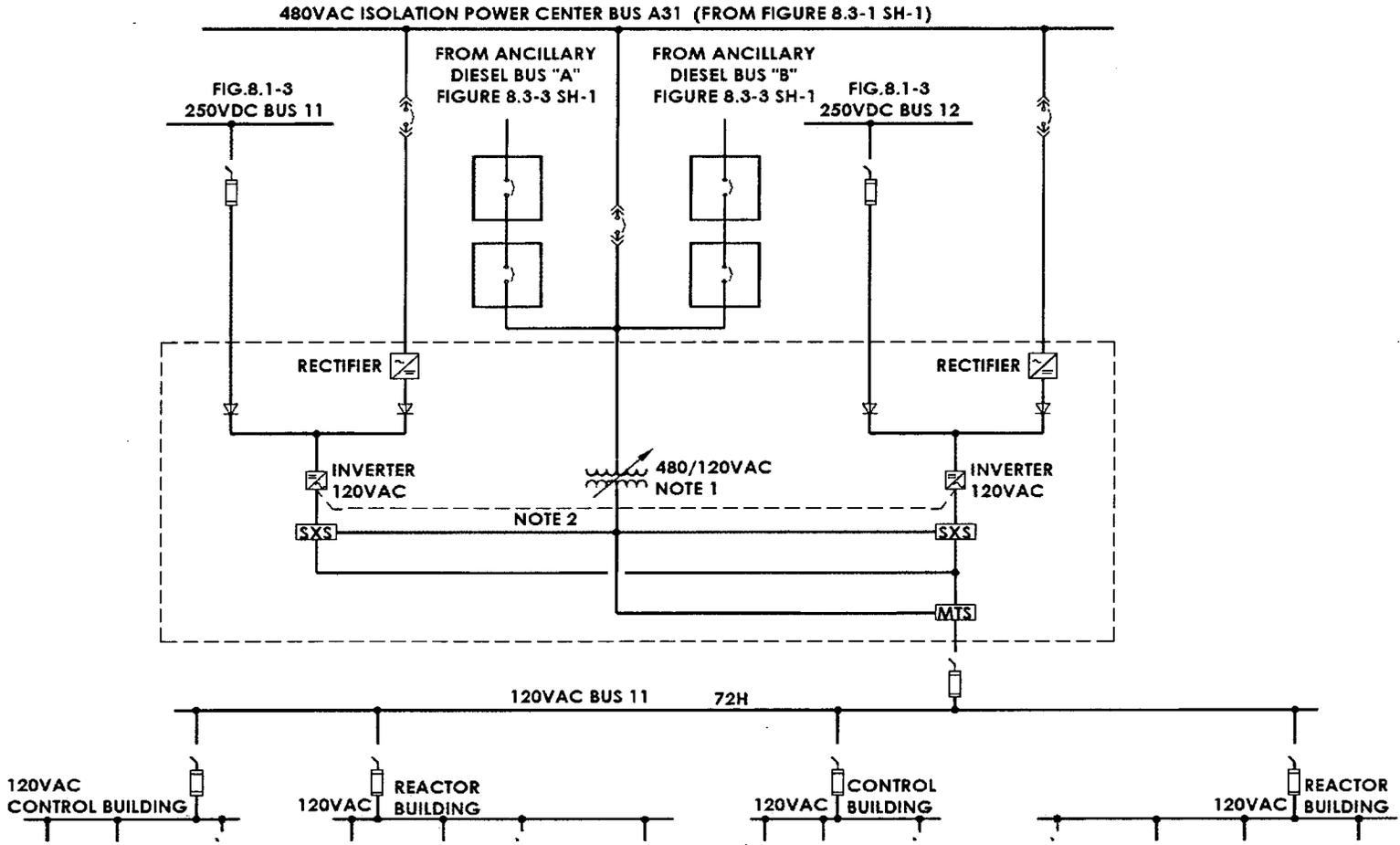
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Battery Side



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UPS Side



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Nominal Conservative Load Table

- Loads Developed With The Best Engineering High End Conservative Estimates From Experience



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Nominal Conservative Load Table Per Division

Time in minutes	T = 0 – 1 minutes	T = 1 – 5 minutes	T = 5 – 7 minutes	T = 7 – 15 minutes	T = 15 – 17 minutes	T = 17 – 4320 minutes
Power in Watts Div. 1	26,259	19,618	22,118	20,501	20,618	20,501
Power in Watts Div. 2	26,259	19,618	22,118	20,501	20,618	20,501
Power in Watts Div. 3	23,604	23,993	26,180	24,563	24,680	24,563
Power in Watts Div. 4	23,604	23,993	25,805	24,188	24,305	24,188



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Calculation Performed To IEEE 485 - 1997TM

Standard Factors Included

- Temperature Correction Factor = 1.11
- Aging Factor = 1.25
- Design Margin Factor = 1.05

Additional Factors

- Uncertainty In Float Current Monitoring = 1.10
- State Of Charge After 24 hour Recharge = 1.05264



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Other Conservative Factors

- Battery Load Sharing Factor = 1.05
- Constant Current Curves Used Utilizing Minimum Battery Voltage Of 210 V And Not Constant Power Curves
- Inverter Efficiency = 0.80
- Inverter Power Factor = 0.80



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Results of Calculations

Sized To 1.75 VPC At 8 hour Rate At 25°C

	AH Required	AH Rated Battery	Remaining AH Margin
Div. 1 Battery. A	5001	6000	19.9 %
Div. 1 Battery. B	5001	6000	19.9 %
Div. 2 Battery. A	5001	6000	19.9 %
Div. 2 Battery. B	5001	6000	19.9 %
Div. 3 Battery. A	5835	6000	2.8 %
Div. 3 Battery. B	5835	6000	2.8 %
Div. 4 Battery. A	5835	6000	2.8 %
Div. 4 Battery. B	5835	6000	2.8 %



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Enclosure 3

Affidavit

GE Hitachi Nuclear Energy

AFFIDAVIT

I, **Larry J. Tucker**, state as follows:

- (1) I am the ESBWR Engineering Manager, GE Hitachi Nuclear Energy (GEH) 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 GEH letter MFN 08-610, Mr. James C. Kinsey to U.S. Nuclear Regulatory Commission, entitled "*Presentation Slides Prepared for DCD, Revision 5, Chapter 8 Audit on July 29, 2008*"— GEH Proprietary Information, dated August 19, 2008 is delineated by a [[dashed 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, GEH 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 qualifies 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 GEH competitors without license from GEH 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 GEH customer-funded development plans and programs, resulting in potential products to GEH;
 - 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 GEH, 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 GEH, 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 GEH 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 GEH 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 details of GEH ESBWR methods, techniques, information, procedures, and assumptions related to the application of the electric power schemes to the GEH ESBWR.

The development of the evaluation process along with the interpretation and application of the regulatory guidance is derived from the extensive experience database that constitutes a major GEH asset.

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

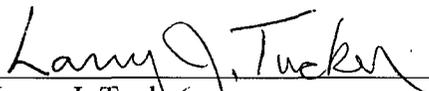
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GEH's competitive advantage will be lost if its competitors are able to use the results of the GEH 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 GEH 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 GEH 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 August 2008.



Larry J. Tucker
GE Hitachi Nuclear Energy