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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 09-247

Docket No. 52-010

April 16, 2009

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. 316 - Related to ESBWR Design Certification Application – RAI Number 4.2-25 Supplement 2**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by the Reference 1 NRC letter. GEH response to RAI Number 4.2-25 Supplement 2 is addressed in Enclosures 1 and 2.

Enclosure 1 contains GEH proprietary information as defined by 10 CFR 2.390. GEH customarily maintains this information in confidence and withholds it from public disclosure. Enclosure 2 is the public version, which does not contain proprietary information and is suitable for public disclosure.

The affidavit contained in Enclosure 4 identifies that the information contained in Enclosure 1 has been handled and classified as proprietary to GEH. GEH hereby requests that the information in Enclosure 1 be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and 10 CFR 9.17.

If you have any questions or require additional information, please contact me.

Sincerely,

Charles W. Boyle
for

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRO

Reference:

1. MFN 09-179, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 316 Related to the ESBWR Design Certification Application*, dated March 5, 2009.

Enclosures:

1. MFN 09-247 – Response to Portion of NRC Request for Additional Information Letter No. 316 - Related To ESBWR Design Certification Application – RAI Number 4.2-25 S02 – GEH Proprietary Information
2. MFN 09-247 – Response to Portion of NRC Request for Additional Information Letter No. 316 - Related To ESBWR Design Certification Application – RAI Number 4.2-25 S02 – Public Version
3. MFN 09-247 – Response to Portion of NRC Request for Additional Information Letter No. 316 - Related To ESBWR Design Certification Application – RAI Number 4.2-25 S02 - Affidavit

cc: AE Cubbage USNRC (with enclosures)
JG Head GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
eDRF 0000-0084-2503/R6

Enclosure 2

MFN 09-247

Response to NRC Request for

Additional Information Letter No. 316

Related to ESBWR Design Certification Application

RAI Number 4.2-25 S02

Public Version

NRC RAI 4.2-25, Supplement 2

ESBWR Marathon control blade capsule impact test

In response to RAI 4.2-25, Supplement 1, GEH performed an impact test on the ESBWR Marathon control blade capsules under ESBWR control blade scram conditions; however, the results were not supplied as requested by the RAI. Please provide (1) a description of the test procedure including the acceptance criteria, and (2) results from the test.

GEH Response

As noted in the response to Supplement 1 of this RAI, mechanical testing of the ESBWR Marathon capsule has been successfully completed. The following presents additional detail on the test procedure, acceptance criteria, and results from the test.

Purpose

To confirm the structural integrity of the boron carbide capsule crimped end cap connection.

Like the BWR/2-6 Marathon control rod, the ESBWR Marathon control rod contains capsules filled with compacted boron carbide powder. The powder is contained in the capsule using crimped end cap connections at either end of the capsule. The capsules are then sealed within the outer absorber tubes. The capsules use a crimped connection to allow for the release of helium gas, which is generated as boron carbide is irradiated. This helium gas is contained within the sealed outer absorber tubes.

The absorber capsules are free to move inside the outer absorber tube, within a small, tightly controlled axial gap. At the end of the scram stroke, as the control rod comes to a stop, the column of absorber capsules will translate to the top of the control rod, and impact the end plug that seals the top of the absorber tube.

This test confirms the structural integrity of the crimped connection under repeated scram impact loading, assuming a 100% failed control rod drive buffer.

Test Procedure

The test configuration is shown in Figure 1. The test simulates the scram impact load by dropping a weight on top of a boron carbide capsule. The amount of weight, and the drop height are sized to match the kinetic energy imparted to the capsule during the scram impact. The weight is set equal to that of the heaviest column of boron carbide capsules. The drop height is set such that the speed of the weight on impact with the capsule considers the maximum speed of the control rod during a failed buffer scram. This is [[ ]] for ESBWR.

The weight is dropped on each capsule a total of 30 times, simulating 30 lifetime scrams with a 100% failed control rod drive buffer. This is conservative, as the

end of scram impact speed is significantly less for a scram with an operative control rod drive buffer.

Acceptance Criteria

The acceptance criteria for the test is that the crimp remain intact, with no loss of containment of the boron carbide powder. Capsules are visually inspected to evaluate whether or not the crimp has remained intact and boron carbide containment has been maintained.

Results

Two ESBWR Marathon capsules were tested. In both cases, the crimped end cap connection remained intact, with no loss of containment of the boron carbide powder. Figure 1 compares the appearance of the crimp, before and after the test. The testing of two capsules is considered sufficient, as very little, if any, deformation of capsule components was observed, as shown in Figure 2. It is noted that compared to the original Marathon design, the ESBWR Marathon uses a capsule body tube with a much thicker wall: [[ ]] for the ESBWR Marathon versus [[ ]] for BWR/2-6 Marathon. This results in a very strong crimp.

Based on the test results, it is concluded that the end cap crimp connection for the ESBWR Marathon capsules will remain intact and not lose containment of the boron carbide powder under repeated failed buffer scram loads.

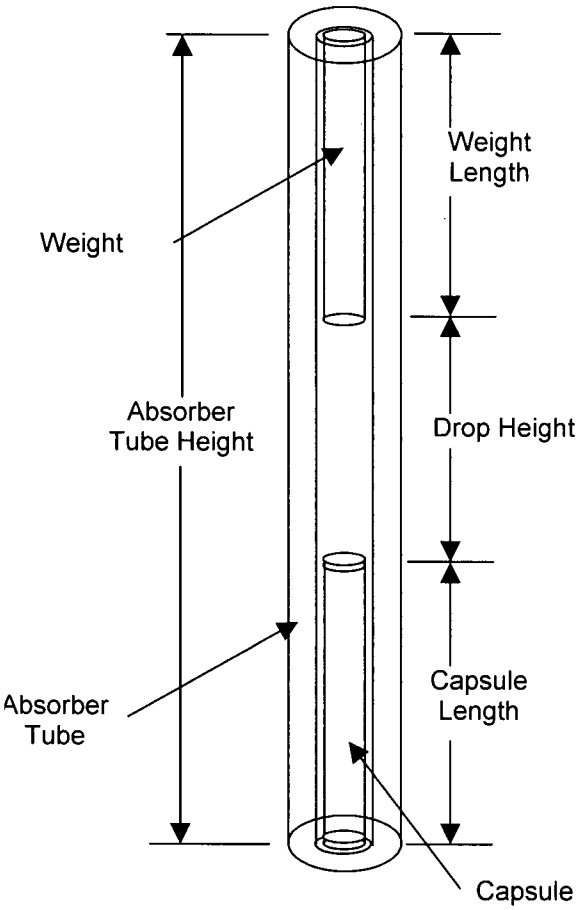

Figure 1: Capsule Drop Test Apparatus

(Not to Scale)

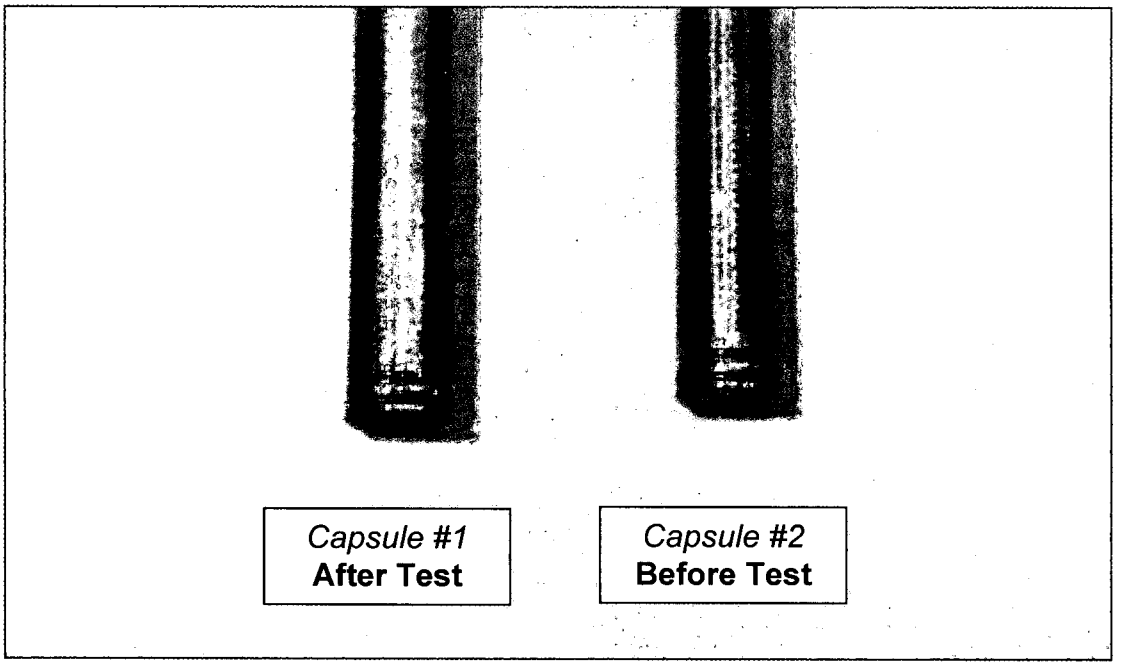

Figure 2: ESBWR Capsule Drop Test Results

DCD Impact

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

Enclosure 3

MFN 09-247

Response to Portion of NRC Request for

Additional Information Letter No. 316

Related to ESBWR Design Certification Application

RAI Number 4.2-25 S02

Affidavit

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, David H. Hinds, state as follows:

(1) I am Manager, New Units Engineering, GE Hitachi Nuclear Energy ("GEH"), 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 GEH's letter, MFN 09-247 Mr. Richard E. Kingston to U.S. Nuclear Energy Commission, entitled "*Response to Portion of NRC Request for Additional Information Letter No. 316 – Related to ESBWR Design Certification Application – RAI Number 4.2-25 Supplement 2,*" dated April 16, 2009. The proprietary information in enclosure 1, which is entitled "*MFN 09-247 – Response to Portion of NRC Request for Additional Information Letter No. 316 – Related to ESBWR Design Certification Application – RAI Number 4.2-25 S02 – GEH 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 or licensee, 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 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 GEH's 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, or subject to the terms under which it was licensed to GEH. 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 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) is classified as proprietary because it contains details of GEH's design and licensing methodology. The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost to GEH.

(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 and obtaining 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 16th day of April 2009.

David H. Hinds
GE-Hitachi Nuclear Energy Americas LLC