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Attachments 1 and 2 contain PROPRIETARY information.

GNRO-2013/00051

August 1, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Responses to NRC Requests for Additional Information Pertaining to the Final Report for the GGNS Replacement Steam Dryer

Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

- REFERENCES:**
1. Entergy Operations, Inc. letter to the NRC, *Final Report for Replacement Steam Dryer*, December 6, 2012 (ADAMS Accession Nos. ML12342A146 and ML12342A147)
 2. NRC letter to Entergy Operations, Inc., *Grand Gulf Nuclear Station, Unit 1 – Request for Additional Information Regarding Entergy’s Final Report for Replacement Steam Dryer (TAC No. MF0343)*, February 25, 2013 (ADAMS Accession No. ML13038A603)

Dear Sir or Madam:

In Reference 1, Entergy Operations, Inc. (Entergy) transmitted to the NRC General Electric – Hitachi (GEH) report NEDC-33765 Supplement 4P, Revision 0, *Grand Gulf Nuclear Station Replacement Steam Dryer EPU Full Re-Analysis and Benchmarking Report*. This report was submitted to satisfy GGNS Operating License Condition 2.C(46)(4).

In Reference 2, the NRC staff transmitted Requests for Additional Information (RAIs) pertaining to information contained in Reference 1.

On April 12, 2013, Entergy informed the NRC of a discrepancy GEH had discovered in the benchmark analysis involving the acoustic model used in Reference 1. To rectify this discrepancy, GEH has revised NEDC-33765 Supplement 4P to reflect corrected analyses. NEDC-33765P Supplement 4P, Revision 1 is provided in Attachment 1.

Responses to the RAIs transmitted via Reference 2 are provided in Attachment 2. These responses were developed based on information contained in NEDC-33765 Supplement 4P, Revision 1, as applicable.

When Attachments 1 and 2 are removed from this letter, the entire letter is NON-PROPRIETARY.

GEH considers Attachment 1 in its entirety and certain information contained in Attachment 2 to be proprietary and, therefore, exempt from public disclosure pursuant to 10 CFR 2.390. Therefore, on behalf of GEH, Entergy requests Attachments 1 and 2 be withheld from public disclosure in accordance with 10 CFR 2.390(b)(1). The associated affidavits for withholding information, executed by GEH, are provided in Attachments 1 and 2. Responses to the RAls developed by GEH were provided to Entergy in a GEH transmittal that is referenced in the affidavit for them.

In accordance with NRC Information Notice 2009-07, *Withholding of Proprietary Information from Public Disclosure*, a non-proprietary version of Attachment 1, NEDC-33765, Supplement 4P, Revision 1, is not being provided since the entire report is proprietary and a non-proprietary version would be of no value. A non-proprietary, redacted version of Attachment 2 is provided in Attachment 3.

If you have any questions or require additional information, please contact Guy Davant at (601) 368-5756.

This letter contains no new regulatory commitments.

I declare under penalty of perjury that the foregoing is true and correct; executed on August 1, 2013.

Sincerely,



BSF/ghd

- Attachments:
1. GEH Report NEDC-33765 Supplement 4P, Revision 1 (Proprietary Version)
 2. Responses to NRC Requests for Additional Information (Proprietary Version)
 3. Responses to NRC Requests for Additional Information (Non-Proprietary Version)

cc: Mr. Arthur T. Howell
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ATTACHMENT 1

GRAND GULF NUCLEAR STATION

GNRO-2013/00051

GEH REPORT NEDC-33765, SUPPLEMENT 4P, REVISION 1

**GRAND GULF NUCLEAR STATION REPLACEMENT STEAM DRYER
EPU FULL RE-ANALYSIS AND BENCHMARKING REPORT**

(GEH PROPRIETARY INFORMATION)

This entire report is PROPRIETARY.

ATTACHMENT 2

GRAND GULF NUCLEAR STATION

GNRO-2013/00051

RESPONSES TO NRC REQUESTS FOR ADDITIONAL INFORMATION

(GEH PROPRIETARY INFORMATION)

The GEH proprietary information is identified by double square brackets. [[This sentence is an example:⁽³⁾]] The superscript notation ⁽³⁾ refers to Paragraph (3) of the affidavit contained in this attachment, which provides the basis for the proprietary determination. Specific information that is not so marked is not GEH proprietary.

ATTACHMENT 3

GRAND GULF NUCLEAR STATION

GNRO-2013/00051

RESPONSES TO NRC REQUESTS FOR ADDITIONAL INFORMATION

(NON-PROPRIETARY INFORMATION)

RESPONSES TO NRC REQUESTS FOR ADDITIONAL INFORMATION

By letter dated September 8, 2010 (ADAMS Accession No. ML102660409), Entergy Operations, Inc. (Entergy) submitted a license amendment request for Grand Gulf Nuclear Station, Unit No. 1 (GGNS). The proposed amendment requested an extended power uprate (EPU), which would increase the maximum steady-state power level at GGNS from the previous licensed thermal power (PLTP) of 3898 megawatts thermal (MWt) to 4408 MWt.¹

By letter dated July 18, 2012 (ADAMS Accession No. ML 121210023), the NRC issued Amendment No. 191 to Entergy approving the EPU for GGNS. As part of this approval, the NRC staff required several license conditions including the submittal of a final report for the replacement steam dryer (RSD) which was to provide a final load definition and stress report of the steam dryer, including the results of a complete re-analysis using the GGNS-specific bias errors and uncertainties (B&U), and transfer function. Entergy submitted this report to the NRC by letter dated December 6, 2012 (ADAMS Accession No. ML123420255).

By letter dated February 25, 2013 (ADAMS Accession No. ML13038A603), the NRC staff transmitted Requests for Additional Information (RAIs) pertaining to the final report. The RAIs with their responses are presented below.

RAI 1

Please explain why the dryer stresses are dominated by [[]] response, as it is not intuitive considering the [[]] safety/relief valve (SRV) tones in the plant.

Response

A review of the frequency content of the pressure load measurements taken at EPU conditions shows that while the amplitude of the [[]] is the highest amplitude in the load spectra, there is a significant amount of pressure loading [[]] [see Figures 19 - 32 in GEH Report NEDC-33765 Supplement 4P, Revision 1, "Grand Gulf Nuclear Station Replacement Steam Dryer EPU Full Re-Analysis and Benchmarking Report," (Reference 1)]. The dryer stresses are a function of the deformation of the structure. In general, it takes much more energy to develop the same relative displacements (i.e., strains) at high frequencies (HF) because of the accelerations required (the exceptions being dynamic amplification or resonant response of the component). Therefore, the cumulative effect of loading [[]]

To demonstrate that most of the displacement or strain (which is indicative of dryer stresses) [[]]

[[]] The resulting curves are provided in Figures 1-1 through 1-12, below. The calculations used the [[]]

[[]]

¹ Throughout this attachment the terms "PLTP" and "CLTP" (current licensed thermal power) are used interchangeably to refer to the previous reactor power level of 3898 MWt, while the newly licensed power level of 4408 MWt is referred to as "EPU" or "EPU power."

[[

Figure 1-1: [[

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[[

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Figure 1-2: [[

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Figure 1-3: [[

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[[

Figure 1-4: [[

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Figure 1-5: [[

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Figure 1-6: [[

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Figure 1-7: [[

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Figure 1-8: [[

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[[

Figure 1-9: [[

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[[

Figure 1-10: [[

]]]]

[[

Figure 1-11: [[

]]]]

[[

Figure 1-12: [[

]]]]

shows [[
]]).

Response

The [[
]] adjustment factors are applied to the calculated stresses [[
]] in the final stress adjustments. Section 5.3.2.3 of Reference 1 describes the process used to develop the [[
]] adjustment factors, which is briefly summarized here. [[

]] The reactor conditions for these [[
]] test points are shown in Table 8 of Reference 1. [[

]]. It should be noted that core flow and dome pressure are independent reactor operating parameters; they do not have a causal relationship, as assumed in RAI 2. This [[
]] provided the basis for adjusting the final EPU stress analysis results for the allowed [[
]] range at full EPU power.

For the final stress adjustments, [[

]] Based on the on-dryer measurements, it was expected that [[
]]. These [[
]] conditions are shown in Table 11 of Reference 1. Figures 69 and 70 in Reference 1 show the resulting adjustment factors for the [[

]]. These adjustment factors are applied to the calculated stresses [[
]] in the final stress adjustments. The [[
]] conditions [[
]] from these figures were used in the final stress adjustments for each component.

The stresses for each dryer component were adjusted [[
]] and the [[
]] condition used in the final stress results. The first column in Table 13 of Reference 1 identifies the limiting [[
]] condition used to calculate the maximum stress for each dryer component. The maximum stress for each component is based on the [[
]] combination of the [[
]] for combining the B&Us.

The changes [[
]] shown in Figure 99 in Reference 1 reflect the [[

]]

As described in Section 5.3.2.3 of Reference 1, the [[

]]

With the change in operating conditions between [[

]] shown in Figure 99 of Reference 1. However, the [[

the change in [[As noted earlier,

]]

The reduction in the MASR from [[]], specified in the response to RAI 06 provided in Attachment 1 to Entergy letter GNRO-2012/00018 (Reference 2), to [[]] in the reanalysis documented in Reference 1 is primarily due to [[

]] changes described in Section 5.4.1.2 [[

and the [[]] effects described in Section 5.3.2 [[]],

]] (Section 4.2.3). It should be noted that [[

]] reflected in Reference 1 resulted in a slight increase in the MASR from the value of [[]] previously reported in GEH Report NEDC-33765 Supplement 4P, Revision 0, "Grand Gulf Nuclear Station Replacement Steam Dryer EPU Full Re-Analysis and Benchmarking Report" (Reference 3).

RAI 3

Figures 94 and 96 in Appendix B of the report show strong VPF response at A5 and S1 sensor locations. Explain how the VPF stresses are accounted for in the final stress analysis of the steam dryer.

Response

The GGNS recirculation pump VPF is 149 Hz, as noted in Section 3.3 of Reference 1. The Plant-Based Load Evaluation (PBLE) loads used in the GGNS EPU flow-induced vibration (FIV) analysis were defined using [[

test condition was used and [[]] In the load definition, the EPU

[[]], Figures 19 to 32 in Reference 1 were rerun [[]] with the VPF loads circled as shown in [[]], below. The VPF signal content can be seen in [[

]]

The [[]] discussed above were then applied to the ANSYS structural FE model to predict the structural response at the sensor locations. Figures 78 through 89 in Appendix A of Reference 1 show the comparison of the projected and measured structural responses at the sensor locations under EPU condition (113%A). To show the effect of VPF loads on the FIV analysis results, these plots were rerun for [[]] as shown in [[]], below. [[]] was used in the load definition. The projected structural responses are compared with the measured responses of the same time interval. [[]]

[[]] It can be seen that the projected and measured structural responses include the VPF load effect. [[]]

[[]]

The final FIV stress results are [[]] as discussed in Reference 1. [[]]

[[]] The application of [[]] ,therefore, explicitly takes into account the ability of the methodology to predict the VPF response [[]]

In summary, using the [[]] The FIV structural analysis results thus include the effects from the VPF loading. [[]]

[[]]

[[The remainder of this response is PROPRIETARY.]]

RAI 4

Please confirm whether the end-to-end B&Us presented in the report are only for the GGNS-specific steam dryer evaluation and not for any future EPU applications or new reactor designs.

Response

The assessment of GGNS end-to-end B&U for future EPU applications or new reactor designs is not within the scope of the final GGNS stress report.

RAI 5

During the start-up and power ascension testing at GGNS, data was obtained for the RSD at 100%, 105%, 110%, and 113% of the previous licensed thermal power (PLTP). However, the

[[]]. The 90-day report should include the B&Us for all measured power levels explaining that a conservative envelope of all cases should be used as the appropriate B&Us for the PBLE methodology.

Response

[[This response is PROPRIETARY in its entirety.]]

RAI 6

The 90-day report utilizes a [[]]. *The report attributes the changes in steam dryer stresses to the* “[[]]

]] Although this approach sheds some light on the trends of these effects, the licensee is requested to provide an explanation regarding the involved physical mechanism.

Response

A review of the on-dryer strain gauge and accelerometer measurements taken at the [[]] test points during initial power ascension showed [[]] Figure 6-1, below, shows the dryer structural response measured during the [[]] period.

[[

]]

Figure 6-1: Dryer Structural Response to Changes in [[]]

The measurement values at each test point were normalized to show a percentage difference from the average measurement over the ten test points. The measurements were then averaged together for the upper dryer sensors and for the lower dryer sensors as shown in Figure 6-1. Curves are shown for the peak sensor values and the RMS values. The curves show the same overall trend of [[]]

The key reactor operating parameters during this time period are shown in Figure 6-2, below.

[[

]]

Figure 6-2: Reactor Operating Parameters – Test Conditions 100A through 100J

The [[]] test measurements were taken at intervals of [[]]

]]

The physical basis for the [[]] effects are described in Section 2.1 of GEH Report NEDC-33765 Supplement 1P, Revision 0, “Grand Gulf Nuclear Station Replacement Steam Dryer Power Ascension Monitoring Test Point 4102 MWth Report (Reference 7) when the effect was first noted and are also briefly described in Section 5.3.2.2 of Reference 3 and the response to RAI 2, above. The physical basis for the [[]] effects are described in Section 5.3.2.3 (page 90) of Reference 3. The [[]]

]]

[[]]

The water level in the RPV is maintained at a constant level outside the dryer skirt by the level control system. The bulk (average) water level inside the skirt is determined by the hydrostatic head equivalent to the pressure drop of the steam flow through the dryer banks, which remains constant at constant power. [[

]]

As part of the original BWR/6 design optimization in the early 1970s, a full-scale mockup of a 30° sector of the [[

The test considered two system flow paths: (1) [[

]]

The [[]] results were reviewed in order to understand the observed GGNS dryer response to changes in [[]]. The tests covered a wide range of [[

]]
However, when considering the GGNS geometry and test conditions relevant to GGNS power operation (PLTP up through EPU over the licensed core flow range), the test results show [[

]]

As shown in Figure 6-2, above, the [[

vibrations.]] Both of these effects may affect dryer

At the [[]] test points, the GGNS reactor operating conditions are near the original [[]] Because the [[]] at these conditions, it is expected there was [[]] during the time the [[]] measurements were taken. Therefore, the observed variation in dryer structural response over the [[]] conditions is most likely due to [[]]

Summary

[[]]

]]

RAI 7

The licensee employs the PBLE Method 1 to predict the pressures on the entire steam dryer using the measured pressure results. At CLTP, when all the pressure sensors were working, it uses [[]] as an input to the PBLE Method 1 to predict the pressures on the entire dryer surface [see Figures 82 - 96 in the proprietary Attachment to GNRO 2012-00075 dated July 5, 2012 (ADAMS Accession No. ML12192A113)]. The measured and predicted pressures at [[]] compare well and the pressures at other locations are generally [[]].

However, at EPU, when [[]] pressure sensors [[[]]] had failed, it uses the measured pressures at [[]] to estimate the pressures on the entire dryer surface (see Figures 19 - 32 in the Attachment to GNRO 2012-00150). In contrast to the comparisons at CLTP, [[]] and, in addition, the PBLE Method 1 [[]] the pressures. For example, the comparison of measured and predicted pressures at one of the pressure transducer location (P6) is presented in Figure 23 of the report. At several frequencies, there is a [[]] results for P6. For example, [[]]. Please provide an explanation for these differing comparisons between measured and predicted pressures at CLTP and EPU.

Response

[[This response is PROPRIETARY in its entirety.]]

RAI 8

Table 2 of the report provides the maximum half-range of strains for the GGNS strain gages S1, S2, and S7. Please provide the following additional information:

- (a) *Please describe how the maximum stress locations associated with these strain gages may be identified and the maximum stresses may be estimated.*

Response

[[This response is PROPRIETARY in its entirety.]]

- (b) *Please provide the maximum stress locations associated with these strain gages.*

Response

[[This response is PROPRIETARY in its entirety.]]

- (c) *Please provide the maximum half ranges of strains for these maximum stress locations. Please confirm whether the normalized histograms presented for the GGNS strain gages S1, S2, and S7 in Figure 1 also represent the histograms for the corresponding high-stress locations.*

Response

[[This response is PROPRIETARY in its entirety.]]

RAI 9

Please explain how the pressure regulator set point for the high pressure turbine changes as power is increased from CLTP to EPU. Also, please describe how the pressure regulator setpoint is changed (incrementally or in one step).

Response

The pressure regulator and its setpoint are discussed in Section 5.3.2.1 of References 1 and 3. During the transition from CLTP (3898 MWt) to EPU (4408 MWt), the setpoint was changed while at CLTP power level in one step from 950 psig (CLTP setpoint) to 935 psig (EPU setpoint). This was necessary to ensure the reactor dome pressure at EPU conditions did not exceed the CLTP value, since the GGNS EPU was licensed as a "constant pressure uprate."

Reactor steam dome pressure is controlled via adjusting the intake pressure to the main turbine via the pressure regulator setpoint. During a typical plant startup (reactor pressurization and heatup), the pressure regulator setpoint is only adjusted twice:

- (1) With system steam pressure at 60 psig (~0 – 1% RTP), the pressure regulator setpoint is adjusted to 60 psig to bring the turbine bypass valves on-line for pressure control; and
- (2) With system pressure at 935 psig (~15% RTP), the pressure regulator setpoint is adjusted to 935 psig to supply main steam to the turbine.

During operation above 15% RTP, this setpoint is not adjusted and pressure in the steam dome varies or “floats” with core power.

RAI 10

The GGNS EPU report estimates end-to-end B/U at EPU for PBLE Method 1. However, two pressure sensors had failed and that [[]]. Please confirm whether the B/U thus determined would bound the B/U determined with no pressure sensor failures.

Response

In the original and revised GGNS EPU reports (References 3 and 1, respectively), the PBLE Method 1 and 2 benchmarks provided were a requirement of the GGNS license conditions. The stress assessment for the GGNS EPU analysis was based on the comparison of the dryer strain gage and accelerometer measurements and projections. The dryer adjusted stress with end-to-end B&U includes the effect of the load definition developed [[]]. The report conservatively demonstrates that the GGNS projected peak stress is below the 13,600 psi fatigue limit. If all pressure sensors were available, the PBLE load definition would be different. However, because the end-to-end B&U is determined by benchmarking the final predicted structural response against the measured response, the difference in the load definition would be reflected as a corresponding change in the end-to-end B&U. The net effect is that the end-to-end benchmarking and resulting B&U effectively calibrate the FE prediction to the measured structural response. Therefore, if all pressure sensors were available, it is expected there would be no changes to the conclusions documented in Reference 1.

RAI 11

In Section 4.2.3, the licensee stated that “[[]].” This statement implies that the pressure loads predicted by PBLE Method 2 may not be conservative. Please provide the following additional information:

- (a) *The licensee is requested to provide information regarding the magnitudes of these non-acoustic sources.*

Response

[[This response is PROPRIETARY in its entirety.]]

- (b) *The licensee is also requested to clarify whether the pressure loads predicted by PBLE Method 1 are also non-conservative.*

Response

[[This response is PROPRIETARY in its entirety.]]

RAI 12

Please provide the following additional information:

- a) *The licensee is requested to link the worst-case stress locations shown in Figures 73 - 77 to the dryer strain sensor locations indicated in the CLTP power ascension report GNRO-2012/00075 part 1, Appendix A.*

Response

[[This response is PROPRIETARY in its entirety.]]

- b) *For these worst-case stress locations, the licensee is also requested to provide stress spectra and stress accumulation (total RMS stress accumulation as a function of frequency) plots before and after frequency dependent bias errors and uncertainties (B&U) are applied.*

Response

[[This response is PROPRIETARY in its entirety.]]

- c) *The licensee is further requested to show that [[
]] is conservative compared to using localized B&U from linked nearby sensors. In particular, the licensee is requested to provide supporting information to substantiate the statement made on the bottom of page 124 of section 5.4.1.2 of NEDC-33765 Supplement 4P (Attachment to GNRO-2012/00150) (“... [[
]]”)*

Response

[[This response is PROPRIETARY in its entirety.]]

REFERENCES

1. GEH Report NEDC-33765 Supplement 4P, Revision 1, “Grand Gulf Nuclear Station Replacement Steam Dryer EPU Full Re-Analysis and Benchmarking Report,” July 2013 provided in Attachment 2 to this letter
2. Response to RAI 06 provided in Attachment 1 to Entergy letter GNRO-2012/00018, *Response to Request for Additional Information Regarding Extended Power Uprate*, March 21, 2012 (ADAMS Accession No. ML12082A025)
3. GEH Report NEDC-33765 Supplement 4P, Revision 0, “Grand Gulf Nuclear Station Replacement Steam Dryer EPU Full Re-Analysis and Benchmarking Report,” December 2012 provided in the attachment to Entergy letter GNRO-2012/00150, *Final Report for the Replacement Steam Dryer*, December 6, 2012 (ADAMS Accession No. ML12342A146)

4. GEH Report NEDC-33765 Supplement 3P, Revision 0, September 2012, "Grand Gulf Nuclear Station Replacement Steam Dryer Power Ascension Monitoring - Test Point 4408 MWth Report", provided in the attachment to Entergy letter GNRO-2012/00112, *Summary Report of Replacement Steam Dryer Data*, September 17, 2012 (ADAMS Accession No. ML12261A312).
5. GEH Report NEDC-33601P, Revision 1, "Engineering Report – Grand Gulf Replacement Steam Dryer Fatigue Stress Analysis Using PBLE Methodology," February 2012, provided in Attachment 1 to Entergy letter GNRO-2012/00011, *Response to Request for Additional Information Regarding Extended Power Uprate*, February 20, 2012 (ADAMS Accession No. ML12054A038)
6. Response to Action Item #6 provided in Attachment 1 to Entergy letter GNRO-2011/00088, *Request for Additional Information Regarding Extended Power Uprate*, October 10, 2011 (ADAMS Accession No. ML112840174)
7. GEH Report NEDC-33765 Supplement 1P, Revision 0, "Grand Gulf Nuclear Station Replacement Steam Dryer Power Ascension Monitoring Test Point 4102 MWth Report," August 2012 provided in Entergy letter GNRO-2012/00097, *Summary Report of Replacement Steam Dryer Data*, August 19, 2012 (ADAMS Accession No. ML12233A182)
8. GEH Engineering Report 0000-0140-1855-R0, Revision 0, "Grand Gulf Nuclear Station - Replacement Steam Dryer Power Ascension Test Plan", May 2012, provided in Attachment 1 to Entergy letter GNRO-2012/00046, *Supplemental Information – Power Ascension Test Plan*, May 9, 2012 (ADAMS Accession No. ML12131A535)
9. GEH Report NEDC-33765P, Revision 0, "Grand Gulf Nuclear Station Replacement Steam Dryer Power Ascension Monitoring Current Licensed Thermal Power Test Report," July 2012 provided in the attachment to Entergy letter GNRO-2012/00075, *Summary Report of Replacement Steam Dryer Data*, July 5, 2012 (ADAMS Accession No. ML12192A113)

AFFIDAVIT

I, Peter M. Yandow, state as follows:

- (1) I am the NPP/Services Licensing Manager, Regulatory Affairs, of GE-Hitachi Nuclear Energy Americas LLC (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 letter, 173280-HMK-2013-02, "GEH Responses to Final Report for Replacement Steam Dryer RAIs," dated July 31, 2013. The GEH proprietary information in Enclosure 1, which is entitled "GEH Responses to GGNS SD Final Report RAIs" is identified by a dark red dotted underline inside double square brackets. [[This sentence is an example.^{3}]]. Figures containing GEH proprietary information are identified with double square brackets before and after the object. RAI responses that are GEH proprietary information in their entirety consistent with NRC Information Notice 2009-07 are identified with double square brackets at the beginning and at the end of the response. In each case, the superscript notation ^{3} refers to Paragraph (3) of this affidavit that 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 U.S.C. Sec. 552(b)(4), and the Trade Secrets Act, 18 U.S.C. 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, 975 F.2.d 871 (D.C. Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F.2.d 1280 (D.C. Cir. 1983).
- (4) The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b. Some examples of categories of information that 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 GEH or other companies.
 - b. Information that, if used by a competitor, would reduce their expenditure of resources or improve their competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.
 - c. Information that reveals aspects of past, present, or future GEH customer-funded development plans and programs, that may include potential products of GEH.

- d. Information that discloses trade secret or potentially patentable subject matter for which it may be desirable to obtain patent protection.
- (5) To address 10 CFR 2.390(b)(4), the information sought to be withheld is being submitted to the 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, not been disclosed publicly, and not been made available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary or confidentiality agreements that provide for maintaining the information in confidence. The initial designation of this information as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure are as set forth in the following paragraphs (6) and (7).
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, who is the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or who is the person most likely to be subject to the terms under which it was licensed to GEH. Access to such documents within GEH is limited to 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 or confidentiality agreements.
- (8) The information identified in paragraph (2) above is classified as proprietary because it contains detailed GEH design information of the methodology used in the design and analysis of the steam dryers for the GEH Boiling Water Reactor (BWR). Development of these methods, techniques, and information and their application for the design, modification, and analyses methodologies and processes was achieved at a significant cost to GEH.

The development of the evaluation methodology along with the interpretation and application of the analytical results 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

GE-Hitachi Nuclear Energy Americas LLC

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 31th day of July, 2013.



Peter M. Yandow
NPP/Services Licensing Manager
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