Entergy

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Attachment 1 contains proprietary information.

GNRO-2012/00006

February 6, 2012

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

SUBJECT: Response to Request for Additional Information Regarding
Extended Power Uprate
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCES: 1. Entergy Operations, Inc. letter to the NRC, *License Amendment Request - Extended Power Uprate*, September 8, 2010 (ADAMS Accession No. ML102660403)

Dear Sir or Madam:

The Nuclear Regulatory Commission (NRC) has requested additional information regarding the steam dryer discussed in the Grand Gulf Nuclear Station, Unit 1 (GGNS) Extended Power Uprate (EPU) License Amendment Request (LAR) (Reference 1). Attachment 1 provides responses to the requests for additional information items 2, 3, 5, and 6 requested by the Mechanical and Civil Engineering Branch. Responses to items 1, 4 and 8 through 13 will be provided by 2/15/2012.

GE-Hitachi Nuclear Energy Americas, LLC (GEH) considers portions of the information provided in support of the responses to the request for additional information (RAI) in Attachment 1 to be proprietary and therefore exempt from public disclosure pursuant to 10 CFR 2.390. An affidavit for withholding information, executed by GEH, is provided in Attachment 3. The proprietary information was provided to Entergy in a GEH transmittal that is referenced in the affidavit. Therefore, on behalf of GEH, Entergy requests Attachment 1 be withheld from public disclosure in accordance with 10 CFR 2.390(b)(1). A non-proprietary version of the RAI responses in Attachment 1 is provided in Attachment 2.

When Attachment 1 is removed, the entire letter is non-proprietary.

No change is needed to the no significant hazards consideration included in the initial LAR (Reference 1) as a result of the additional information provided. There are new commitments made in this letter; these are summarized in Attachment 4.

If you have any questions or require additional information, please contact Jerry Burford at 601-368-5755.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 6, 2012.

Sincerely,

MAK/FGB

Attachments:
1. Response to Request for Additional Information, Mechanical and Civil Engineering Branch, Steam Dryer (Proprietary)
2. Response to Request for Additional Information, Mechanical and Civil Engineering Branch, Steam Dryer (Non-Proprietary)
3. GEH Affidavit for Withholding Information from Public Disclosure
4. List of Regulatory Commitments

cc: Mr. Elmo E. Collins, Jr.
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NRC Senior Resident Inspector
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U. S. Nuclear Regulatory Commission
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Attachment 2

GNRO-2012/00006

Grand Gulf Nuclear Station Extended Power Uprate

Response to Request for Additional Information

Mechanical and Civil Engineering Branch, Steam Dryer (Non-Proprietary)

This is a non-proprietary version of Attachment 1 from which the proprietary information has been removed. The proprietary portions that have been removed are indicated by double square brackets as shown here: [[ ]].

Non-Proprietary Information

Response to Request for Additional Information
Mechanical and Civil Engineering Branch

By letter dated September 8, 2010, Entergy Operations, Inc. (Entergy) submitted a license amendment request (LAR) for an Extended Power Uprate (EPU) for Grand Gulf Nuclear Station, Unit 1 (GGNS). The NRC has requested additional information regarding the steam dryer; the responses to questions 2, 3, 5, and 6 are provided below.

RAI 2

MSL strain gage bias errors

The licensee is requested to provide a detailed description of the bias errors and uncertainties (including actual values) of the strain gages used for the QC2, SSES, and GGNS MSL acoustic pressure measurements and how they are accounted for in the PBLE benchmarking and in the GGNS dryer analysis. In particular, the licensee is requested to explain the ramifications [[

]] The licensee is asked to [[

]] Finally, the licensee is requested to address how these errors affect the PBLE benchmarking and the GGNS dryer stress calculations.

Response

The approximately [[

]] are not all directly related to each other. [[ ]] addresses the models of strain gages used at Quad Cities Unit 2 (QC2), Susquehanna Unit 1 (SSES1), and Grand Gulf Nuclear Station Unit 1 (GGNS). [[

Non-Proprietary Information

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The model number nomenclature of the Hitec weldable gages is as follows:

H – Hitec

B – Bonded

W – Weldable

A – Adhesive: Flame Sprayed Alumina

K – Sensing Alloy: “K” Alloy

35 – Gage resistance of 350 Ω

250 – Active Grid Length, thousandths of an inch

6 - Compensation for Steel

6 or 10 – Cable length in feet

FG - Fiberglass Braid Lead Wire

Shield or SHLD – Cable incorporates a shield

HB – Half Bridge configuration (1 active gage and 1 compensating gage)

Non-Proprietary Information

The strain gages used on the MSLs at these plants [[

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[[

]] The following sections discuss the MSL strain measurements at QC2 in May, 2005, at SSES in April and May, 2008, and at GGNS in October and November, 2008. The gages discussed in [[

]]

The last section discusses on-dryer instrumentation. GGNS is moving forward on instrumentation of the GGNS replacement dryer in order to supplement the MSL strain gage measurements. The procedures used and lessons learned for on-dryer instrumentation at QC2 and SSES1 will be implemented.

The following sections address:

1. QC2 MSL measurements, May 2005
2. SSES1 MSL measurements, April-May 2008
3. GGNS and JAF MSL measurements, October-November 2008
4. [[
5.]]
6. Accounting for MSL Pressure Under-Measurement in PBLE Process
7. Grand Gulf Unit 1 On-dryer Instrumentation

Non-Proprietary Information

1. Quad Cities Unit 2

A replacement steam dryer was installed at QC2 in May 2005. Following the installation, MSL strain, dryer strain, dryer acceleration, and dryer dynamic pressure was recorded as the unit ascended in power.

The MSL strain gage measurement system was designed and installed by Exelon. The MSL strain gages were Hitec Products Model Number HBWAK-35-250-6-50FG-F. They were configured as opposed ½ bridges, with diametrically opposite gages forming the opposing arms of the bridge. [[

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Non-Proprietary Information

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Figure 1: [[

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MSL strain gage measurements were not taken during the primary system pressurization test at QC2.

Based on the equipment user's manual and operating experience (Reference 2), it is believed that the strain gage sensitivity was determined by a shunt calibration of the strain gage using an external shunt at the junction box for the MSL strain gages in the data collection area. This shunt calibration was performed prior to the data acquisition after the MSLs were at operating temperature.

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Non-Proprietary Information

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2. Susquehanna Unit 1

A replacement steam dryer was installed at SSES1 in April 2008. Following the installation, MSL strain, dryer strain, dryer acceleration, and dryer dynamic pressure were recorded as the unit ascended in power.

The MSL strain gage measurement system was designed and installed by PPL. The MSL strain gages were Hitec Products Model Number HBWAK-35-250-6-10FG-SHLD-HB. Note that these gages have the new design or wider cross-section. Figure 1 compares the original design to the new design.

MSL strain gage measurements were not taken during the primary system pressurization test at SSES1.

Based on the user's manual and operating experience, it is believed that the strain gage sensitivity was determined by a shunt calibration of the strain gage using the internal shunt capability of the VXI Technology EX1629 (Reference 3).

[[

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3. Grand Gulf Nuclear Station Unit 1 and James A. Fitzpatrick Unit 1

During RF16 in September and October of 2008, strain gages were installed on the MSLs at GGNS. During RF18 in September and October of 2008, strain gages were installed on the MSLs at JAF.
[[

]] Further details of the GGNS MSL strain gage installation and testing are documented in Reference 1, Appendix G.

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Non-Proprietary Information

Non-Proprietary Information

Non-Proprietary Information

Non-Proprietary Information

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6. Accounting for MSL Under-Measurement in PBLE Process

No MSL strain data recording was performed during the primary system pressurization tests (hydro tests) at QC2 and SSES at the time of data collection from the sensors. [[

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During the QC2 PBLE benchmarking process, [[ ]] was developed for prediction of steam dryer loads based on the MSL acoustic pressure measurements. The [[

Non-Proprietary Information

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7. Grand Gulf Unit 1 On-dryer instrumentation

GGNS has elected to pursue on-dryer instrumentation for the GGNS replacement dryer. Specific details of the data acquisition system (DAS) are still being finalized. The planned strain gages are Kyowa Model KHC-10-120-G9, the model used on the QC2 and SSES1 replacement dryers, or an equivalent model.

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Non-Proprietary Information

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The installation and data acquisition procedures for the GGNS on-dryer instrumentation will follow the procedures used at QC2 and SSES1 and incorporate operating experience from those measurement sessions. [[

The installation procedure, data acquisition procedure, instrumentation acceptance criteria, and instrumentation startup report from the previous work will be updated for GGNS. Examples of these documents from QC2 and SSES are References 4, 5, 6 and 7. Figure 3 is strain gage S9 as installed on the QC2 replacement steam dryer.

Non-Proprietary Information

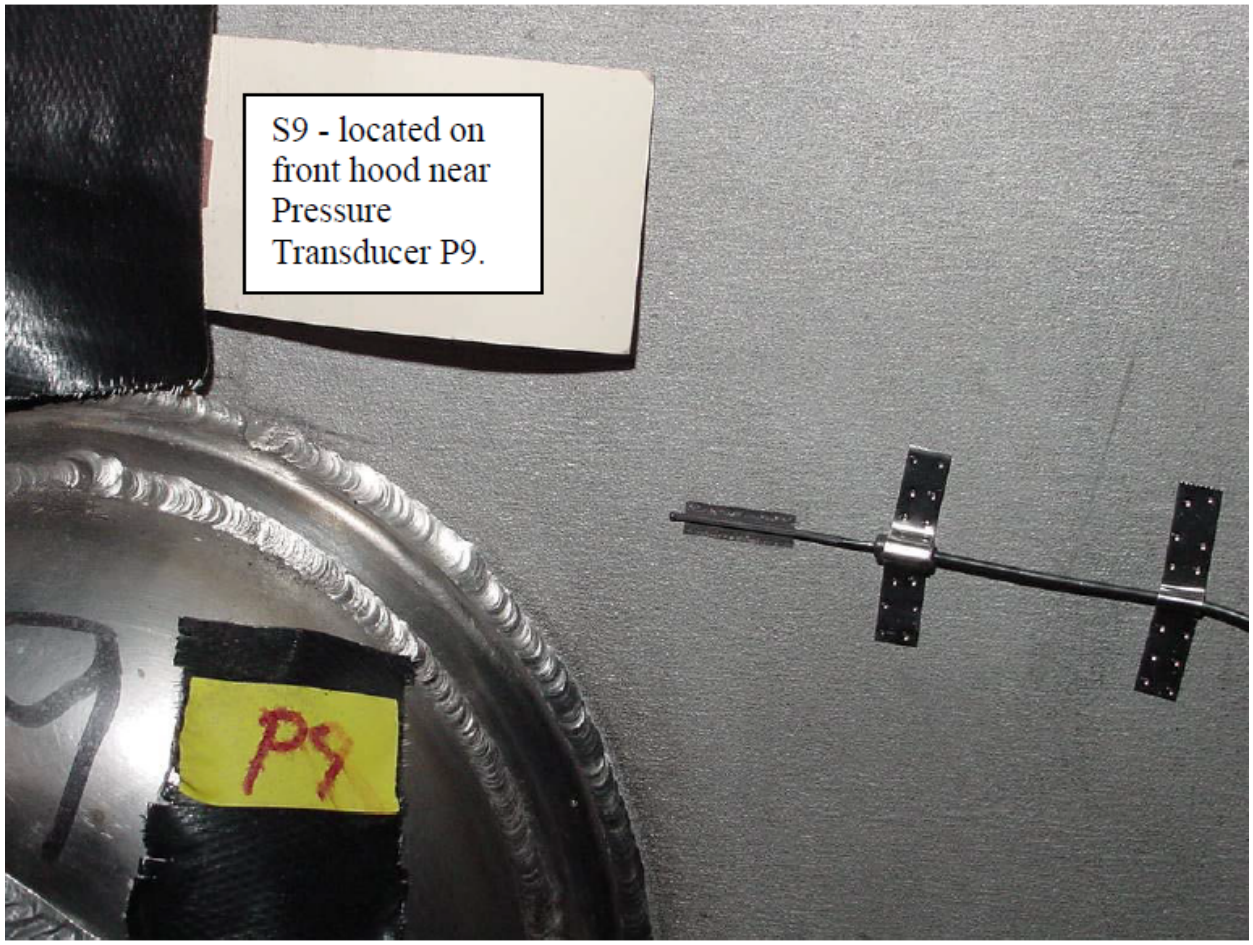

Figure 3: QC2 Replacement Dryer, Strain Gauge S9.

Non-Proprietary Information

References

[1] NEDC-33601P Revision 0, Engineering Report Grand Gulf Replacement Steam Dryer Fatigue Stress Analysis Using PBLE Methodology, September 2010.

[2] Yokogawa DL750/DL750P ScopeCorder User's Manual, IM 701210-05E, IM 701210-06E (filename: IM701210-04E_031_DL750Manual.pdf).

[3] VXI Technology EX1629 48-Channel Strain Gage Instrument User's Manual, P/N: 82-0109-000 (filename: EX1629 manual.pdf).

[4] 26A6487R3-NP, Steam Dryer Vibration Instrument Installation Procedure, April 2005 (NRC ADAMS Database ML051440097).

[5] 26A6492R2-NP, Steam Dryer Vibration Instrument Installation Procedure, April 2005 (NRC ADAMS Database ML051330051).

[6] Susquehanna Replacement Steam Dryer Instrumentation Acceptance Criteria – Dryer Mounted Instrumentation, Revision 2, February 2008 (NRC ADAMS Database ML080660255).

[7] Susquehanna Unit 1 Replacement Steam Dryer Vibration Instrumentation Program NRC Summary Test Report, July 2008 (NRC ADAMS Database ML082830074).

Non-Proprietary Information

RAI 3

Stresses near partial penetration welds in the GGNS and SSES dryers

The licensee is requested to provide a full accounting of all errors in alternating stress calculations made near welds in the GGNS and SSES dryer, and in particular near partial penetration welds. For GGNS, the licensee is requested to provide a complete list of any dryer design changes, including weld changes that were specified to reduce alternating stresses below 50% of the ASME alternating stress limits.

Response

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Table 1 provides a complete list of the dryer design changes that have been specified to reduce the alternating stresses below 50% of the ASME alternating stress limit for the GGNS replacement steam dryer. Also listed is the error that prompted the design change. The locations of the modifications are shown in the Figures 1 through 6. Table 1 indicates the figure associated with each modification.

Non-Proprietary Information

Table 1 - List of Design Changes

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Non-Proprietary Information

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Figure 1 - [[

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Non-Proprietary Information

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Figure 2 - [[

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Non-Proprietary Information

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Figure 3 - [[

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Non-Proprietary Information

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Figure 4 - [[

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Non-Proprietary Information

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Figure 5 - [[

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Non-Proprietary Information

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Figure 6 - [[

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Non-Proprietary Information

RAI 5

Dryer Inspection Plan (Follow-Up to Round 4, RAI 8)

a. In response to RAI 8(a)(ii) in the previous round of RAIs, the applicant states that the steam dryer inspection plan includes a detailed inspection of the dryer in order to identify potential problems related to fabrication. The licensee is requested to explain whether the inspection plan would include inspection of the partial penetration welds. Also explain whether industry operating experience includes any fatigue cracking of partial penetration welds. The licensee is also requested to provide the root cause report for SSES (which is prototype for GGNS) steam dryer cracking (fatigue cracking of seismic block-support ring area)

b. In response to RAI 8(b), the applicant states that it will follow the inspection recommendations of the BWRVIP-139 and consider the detailed inspection results (mentioned above in (a) above) in developing the re-inspection plan for the GGNS Replacement Steam Dryer (RSD). The licensee is requested to quantify the re-inspection frequency. The licensee is also requested to explain whether the re-inspection frequency and scope would be adequate for a timely detection of high-cycle fatigue cracks, which may take place within the first three or four cycles of operation or after as long as 16 years of operation as described in General electric Service Information Letter, SIL No. 644, Rev. 2 (P. 3, *BWR/5-Style Dryer Observation*)

Response

a. In the response to RAI 8 included in Reference 1, the objective of the inspection plan was described as "…to identify potential problems that may occur early in the dryer life (e.g., fabrication-related issues)." The inspection recommendations in BWRVIP-139, "Steam Dryer Inspection and Flaw Evaluation Guidelines," include welds that may be susceptible to fatigue cracking as indicated by industry operating experience as well as welds that may be susceptible based on stress analysis results. The inspection recommendations in BWRVIP-139 and SIL No. 644 Rev. 2 are not based on the type of weld. While the inspection of partial penetration welds is not explicitly invoked in the recommendations of BWRVIP-139, as noted in Reference 2 (see response to RAI 9), it was identified that some of the partial penetration welds in three areas of the dryer did not meet the fatigue acceptance criterion. Entergy will include the remaining qualified partial penetration welds in these areas as well as the full-depth groove welds that replaced those partial penetration welds that could not be qualified in its inspection plan. These welds are to be inspected during the baseline inspection to be performed at the end of the cycle following the power uprate outage.

   Entergy is not aware of any operating experience indicating fatigue cracking of partial penetration welds in BWR steam dryers. In the original BWR/6 dryers, there have been a few instances of cracking in the full penetration weld between the top cap and the bank end plate. A sample of this crack is shown in Figure 6 in the response to RAI 6 below. The cracking was caused by the levering action of the tie bar attached to the top cap directly above the weld.

Non-Proprietary Information

The cracks were mitigated by stop-drilling the crack tips. This is one of the locations where partial penetration welds were used on the prototype replacement dryer. Several changes were made in the prototype replacement dryer design to preclude cracking in this location. The top cap thickness was increased from 0.25 inches to 0.75 inches, the bank end plate thickness was increased from 0.5 inches to 0.75 inches, and a more flexible tie bar design was used. In addition, the tie bar was mounted inboard from the edge of the bank so that the tie bar pad weld was not bearing directly on the top cap weld. For the GGNS replacement dryer, the partial penetration welds in this location have been replaced with full-depth groove welds.

Entergy made the commitment In Reference 3 to provide a summary report describing the conclusions of the SSES Unit 2 skirt crack evaluation as well as the potential impact of its findings on the GGNS steam dryer once the root cause evaluation effort has been finalized. This information is to be provided in response to RAI 12 by 2/15/2012.

b. As outlined in BWRVIP-139, the recommended inspections include a baseline inspection followed by a graded-approach re-inspection plan. For those plants implementing a power uprate, another baseline inspection should be performed after one cycle of operation at the uprated power conditions. The re-inspection guidance is outlined in Section 5.3.4 of BWRVIP-139. It calls for inspections of any repaired regions of the dryer in accordance with BWRVIP-181, routine inspections each cycle of any unrepaired cracks until they have been demonstrated to have stabilized, and an extensive inspection at a frequency not exceeding five 24-month cycles or seven 18-month cycles, whichever is applicable.

   The inspection recommendations of BWRVIP-139 were made considering the steam dryer operating experience up to the date of issuance of the report. This included the steam dryer damage at Quad Cities that was attributed to high frequency pressure loading. Industry operating experience to date has shown that this inspection program is adequate for timely detection of high-cycle fatigue cracks; this program, of course, may be adjusted in response to future applicable industry operating experience related to steam dryer issues.

   A search of the INPO operating experience database for any reports dealing with ‘‘partial penetration weld” did return nearly 80 hits. However, only two of these related to operating experience associated with a BWR; these two reports dealt with the same incident (May 1997) at Nine Mile Point and mentioned a partial penetration weld found in the moisture separator reheater. Note that this event was really about the operator error; the “hit” was due to the fact the report noted that a partial penetration weld in the design had actually been fabricated as a fillet weld. There were no reports of issues associated with partial penetration welds in BWR steam dryers. Entergy maintains an operating experience review program; this provides assurance that future operating experience derived from steam dryer inspections in the industry is appropriately identified, assessed and assimilated into on-going programs. In addition, Entergy is a member of the BWRVIP and is attentive to the guidance and recommendations they issue.

Non-Proprietary Information

REFERENCES

1. Entergy letter "Request for Additional Information Regarding Extended Power Uprate," dated November 14, 2011. (GNRO-2011-00101, NRC Accession No. ML113190403)
2. Entergy letter "Request for Additional Information Regarding Extended Power Uprate," dated November 25, 2011. (GNRO-2011-00105, NRC Accession No. ML113290137)
3. Entergy letter "Request for Additional Information Regarding Extended Power Uprate," dated October 10, 2011. (GNRO-2011-00088, NRC Accession No. ML112840174)

RAI 6

Partial penetration Welds (Follow-Up to Round 4, RAI 9)

a. In response to RAI 9(a) in the previous round of RAIs, the applicant states that the weld fatigue factors are discussed in Subsections 3.3.4.3 and 3.3.4.4 of NEDC-33601, "Grand Gulf Steam Dryer Fatigue Stress Analysis Using PBLE Methodology". The staff does not find any discussion of fatigue factors in these sections, but it does find it in Section 3.3.2.2.3 of NEDC-33601, which discusses fatigue factors for [[ ]] but not partial penetration welds. In addition, Section 4.2 of Appendix F, NEDC-33601, states, "The weld types of relevance for the steam dryer analysis are the [[ ]]" and discusses weld factors for these two types of welds. Figure 4.2-1 of Appendix F only refers to these two types of welds. The lack of discussion on partial penetration welds provides a false impression that the fatigue assessment of these welds is not important for the structural integrity of the RSD. The staff therefore requests that the applicant modify Section 3.3.2.2.3 of NEDC-33601 and Section 4.2 and Figure 4.2-1 of Appendix F by discussing the fatigue factor for partial penetration welds.

b. The response to RAI 9(c) in the previous round of RAIs states that all partial penetration welds in the RSD have been evaluated and only one weld was not analyzed in accordance with the response to RAI 9(b). The licensee is requested to explain how many partial penetration welds are in the RSD, what are the plate thicknesses at these locations and any applicable undersize factors.

Non-Proprietary Information

Response

a. A revised version of the affected sections of the Steam Dryer Analysis Report, which is NEDC-33601, is provided below. This report was included as Attachment 11 in the GGNS Extended Power Uprate License Amendment Request. Change bars have been provided to identify text that has been changed.

NEDC-33601, Section 3.3.2.2.3 Weld Factors

Weld Factors

A key component of the fatigue alternating stress calculation at a specific location is the appropriate value of the stress concentration factor (SCF). The weld types of relevance for the steam dryer stress analysis are the [[ ]] (Section 4.2 of Appendix E). Since the use of a weld quality factor is for static rather than for fatigue applications, the peak stress is based on the calculated [[ ]] Figure 4.2-1 of Appendix E shows the flow diagram for the calculation of fatigue stress with appropriate SCFs.

For the case of NG-3352 Type I and III full penetration welded joints, the recommended SCF value is 1.4. In this case, the finite element stress is directly multiplied by the appropriate SCF to determine the fatigue stress. Although the recommended 'f' factor for Type I and III welds in the NG table is 1.0, a SCF of 1.4 is recommended [[ ]]

The weld factor value [[ ]] can be derived [[

]] multiplier to obtain the fatigue stress.

In addition to full penetration welds and fillet welds, partial penetration groove welds also exist in the Grand Gulf replacement steam dryer as allowed by the ASME Section III Subsection NG-3352. A partial penetration groove weld is expected to have root discontinuities similar to those in fillet welds. [[

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Non-Proprietary Information

Weld Quality Factor

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NEDC-33601, Appendix E, Section 4.2

4.2 WELD FACTOR

A key component of the fatigue alternating stress calculation at a specific location is the appropriate value of the stress concentration factor (SCF). The weld types of relevance for the steam dryer stress analysis are the [[

]]

For the case of NG-3352 Type I and III full penetration welded joints, [[

]]

For the case of a fillet or partial penetration groove weld, there are two distinct analysis paths depending on whether the stress was obtained from a shell element or a solid element model. [[

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The following describes the process of determining nominal stress near the weld for the shell model. [[

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The stress may also be obtained from the shell finite element model peak stress intensities obtained from time history analysis. Because the shell finite element model of the full steam dryer is not capable of predicting the full stress concentrations in fillet or partial penetration welds, weld fatigue factors, and if necessary weld size reduction factors, for fillet or partial penetration welds are applied to the calculated peak stress intensities to determine the fatigue stress.

The weld size reduction factor may be needed as stated above. When using the traditional Strength of Materials formulas, the effective weld size is taken into account in the weld section properties. [[

Non-Proprietary Information

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If the shell model is not capable of determining the peak stress for the fillet or partial penetration weld then a solid submodel of the weld region is created. In other words, this approach is used when the global shell model is inadequate to resolve the load path in small local regions of the steam dryer. These regions are typically places with small discontinuities in the structure where the coarser shell model or even a more refined shell model cannot adequately provide the proper local load path. [[

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The guidance above is based on Section III, Subsections NG and NB, of the ASME BP&V Code (Reference 1). The approaches of applying SCFs to shell and solid models described above are applicable to both bending and membrane stresses. The recommended SCF of 4 for the fillet or partial penetration welds is what has been recommended as the fatigue factor 'f' in Table NG-3352-1 of ASME Section III, Sub-section NG, for fillet or partial penetration welds. In recommending the use of this fatigue factor, Paragraph NG-3352 does not make a distinction in terms of the applicable stress types that is whether it is membrane, bending or combination of both.

The similar weld factor value for fillet welds can be derived using two sub factors: the first sub-factor (equivalent to C index in the piping fatigue stress analyses) accounts for the increase in the through-section stress over and above the nominal stress away from the weld discontinuity, and the second sub-factor (equivalent to K index in the piping fatigue stress analyses) accounts for the root discontinuities at the weld itself. A partial penetration groove weld is expected to have root discontinuities similar to those in fillet welds. [[

]] 1.8 is the maximum specified value of K index in Table NB-3681(a)-1 (i.e., for as-welded girth butt welds). Table NB-3681(a)-1 provides K index of 1.2 for stress due to internal pressure, 1.8 for stress due to moment loading and 1.7 for stress due to thermal loading. [[

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Non-Proprietary Information

NEDC-33601, Appendix E, Figure 4.2-1

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Figure 4.2-1 Weld (Fatigue) Factor Flow Diagram

Non-Proprietary Information

b. There are [[ ]] where joints containing partial penetration welds have been used in the GGNS replacement dryer. These areas and the details of the joints are provided in the Table 1 and the figures below. All partial penetration welds in the GGNS replacement dryer, as listed in the table, have been evaluated except the partial penetration weld area #5. The partial penetration weld area #5 is [[

]] So it does not require the structural analysis.

In the operating dryers, there have been [[

]] A fatigue crack in a weld in the trough/bank end plate/base plate region would be unlikely to generate a loose part because of the [[

]]

In the [[ ]], there have been a few instances of [[

]] A sample of this crack is shown in Figure 6. The cracking was caused by [[

]] Therefore, it is very unlikely that a loose part will be generated due to a crack in one of these welds.

Several improvements in the GGNS replacement dryer have been made as a result of this operating experience. [[

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There have been no instances of fatigue cracking in [[ ]] in dryers that have used the same tie bar design as the GGNS replacement dryer. [[

]] Thus, the tie bar is very unlikely to become a loose part during one operating cycle.

Non-Proprietary Information

Table 1 - Partial Penetration Welds in GGNS Replacement Dryer

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{3}]]

Non-Proprietary Information

Notes for Table 1:

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Non-Proprietary Information

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Figure 1 - Inlet end plates-inner and outlet end plates-inner to outside of trough sections welds

Non-Proprietary Information

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Figure 2 - Base plate to support ring weld

Non-Proprietary Information

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Figure 3 - Center bank tie bar to tie bar pad welds

Non-Proprietary Information

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Figure 4 - Seismic blocks to support ring weld

Non-Proprietary Information

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Figure 5 - Anti-rotation weld of adjusting ring to splice bar

Non-Proprietary Information

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Figure 6 - Top cap to bank end plate crack

Attachment 3

GNRO-2012/00006

Grand Gulf Nuclear Station Extended Power Uprate

Response to Request for Additional Information

Mechanical and Civil Engineering Branch, Steam Dryer

GEH Affidavit for Withholding Information from Public Disclosure

GE-Hitachi Nuclear Energy Americas LLC

AFFIDAVIT

I, Edward D. Schrull, PE state as follows:

(1) I am the Vice President, Regulatory Affairs, Services Licensing, 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-JB-058, "Grand Gulf Steam Dryer: Transmittal of Steam Dryer Requests for Additional Information (RAI) 2, 3 and 6," dated February 5, 2012. The GEH proprietary information in Enclosure 1, which is entitled "GEH Response to Requests for Additional Information 2, 3 and 6, GEH Proprietary Information - Class III (Confidential)" is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]] Figures, equations and some tables containing GEH proprietary information are identified with double square brackets before and after the object. Attachment 1 to Enclosure 1 is proprietary in total, thus, it carries the notation "GEH Proprietary Information - Class III (Confidential){3}" in the header. 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 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 F2d 871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704 F2d 1280 (DC 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 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, resulting in potential products to GEH;

d. Information that discloses trade secret and/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 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 and/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 and/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 processes along with the interpretation and application of the analytical results is derived from the extensive experience databases that constitute 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 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 5th day of February 2012.

Edward D. Schrull, PE
Vice President, Regulatory Affairs
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Attachment 4

GNRO-2012/00006

List of Regulatory Commitments

List of Regulatory Commitments

The following table identifies those actions committed to by Entergy in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

COMMITMENT	TYPE (Check one)		SCHEDULED COMPLETION DATE (If Required)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
Responses to items 1, 4 and 8 through 13 will be provided.	**X**		**2/15/12**
Entergy will include the remaining qualified partial penetration welds in these areas as well as the full-depth groove welds that replaced those partial penetration welds that could not be qualified in its' inspection plan. These welds are to be inspected during the baseline inspection to be performed at the end of the cycle following the power uprate outage. (response to RAI 5)	**X**		**RF19**
Entergy made the commitment to provide a summary report describing the conclusions of the SSES Unit 2 skirt crack evaluation as well as the potential impact of its findings on the GGNS steam dryer once the root cause evaluation effort has been finalized in Reference 3. This information is to be provided in response to RAI 12 by 2/15/2012. (response to RAI 5)	**X**		**2/15/12**