*This Document Contains Proprietary Information - Withhold Enclosure 1 from Public Disclosure Under 2.390(a)(4)*

**Tennessee Valley Authority**, 1101 Market Street, Chattanooga, Tennessee 37402-2801

November 21, 2007

TVA-BFN-TS-431
TVA-BFN-TS-418

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop OWFN, P1-35
Washington, D. C. 20555-0001

Gentlemen:

| | | |
|---|---|---|
| In the Matter of | ) | Docket Nos. 50-259 |
| Tennessee Valley Authority | ) | 50-260 |
| | ) | 50-296 |

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 - TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 - EXTENDED POWER UPRATE (EPU) - RESPONSE TO PRELIMINARY FINDINGS ON STEAM DRYER STRESS ANALYSIS**

By letters dated June 28, 2004 and June 25, 2004 (ADAMS Accession Nos. ML041840109 and ML041840301, respectively), TVA submitted license amendment applications to the NRC for the EPU of BFN Unit 1 and BFN Units 2 and 3, respectively. The proposed amendments would change the operating licenses to increase the maximum authorized core thermal power level of each reactor to 3952 megawatts. By letter dated July 27, 2007 (ML072130371), TVA submitted the completed BFN steam dryer stress analyses for Units 1, 2 and 3. On October 23, 2007, the NRC staff issued preliminary findings on the review of the steam dryer analyses which included six requests for additional information (RAI). The enclosure to this letter provides TVA's responses to the six RAIs.

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NRR

Please note that the information provided in Enclosure 1 contains information that Continuum Dynamics, Inc. (CDI) considers to be proprietary in nature and subsequently, pursuant to 10 CFR 2.390(a)(4), requests that such information be withheld from public disclosure. Enclosure 2 contains the redacted version of the response with the CDI proprietary material removed which is suitable for public disclosure. Enclosure 3 is an affidavit from CDI supporting this request.

TVA has determined that the additional information provided by this letter does not affect the no significant hazards considerations associated with the proposed TS changes. The proposed TS changes still qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

No new regulatory commitments have been made in this submittal. If you have any questions regarding this letter, please contact James Emens at (256)729-7658.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 21st day of November 2007.

Sincerely,

Beth A. Wetzel

Beth A. Wetzel
Manager, Corporate Nuclear Licensing
and Industry Affairs

Enclosures:

1. Response to Preliminary Findings on Steam Dryer Stress Analysis (proprietary version)
2. Response to Preliminary Findings on Steam Dryer Stress Analysis (non-proprietary version)
3. CDI Affidavit

cc (Enclosure):
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ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 -
EXTENDED POWER UPRATE (EPU) - STEAM DRYER ANALYSIS REVIEW

RESPONSE TO PRELIMINARY FINDINGS ON STEAM DRYER STRESS ANALYSIS

(NON-PROPRIETARY VERSION)

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Attached is the **Non-Proprietary Version** of the response to preliminary findings on steam dryer stress analysis.

**NRC Request EMEB.123/90**

By letter dated July 27, 2007, Tennessee Valley Authority (TVA) provided a steam dryer analysis for Units 1, 2 and 3, using frequency-based methodology versus the direct integration time history analytical method that has been employed previously for Quad Cities (QC) 1 and 2, Dresden Units 2 and 3, and Vermont Yankee plants. [[

]] Provide verification and validation of the method by comparing the stresses resulted from finite element (FE) analysis using the direct integration time history method to that obtained from frequency-based analysis using the same FE model and applied transients.

**TVA Reply to EMEB.123/90**

Browns Ferry plans to provide the analysis prepared for Hope Creek to address this question. [[

]] A detailed documentation of the comparison between time domain and frequency domain calculations will be provided to the staff in an analysis performed by CDI for Hope Creek.

**NRC Request EMEB.124/91**

In Table 8B of Continuum Dynamics Incorporated (CDI) reports 7-05P and 07-06P (Enclosures 1 and 2 of the July 27, 2007, letter), TVA reports the minimum stress ratio at current licensed thermal power (CLTP) of 0.96 for Unit 1 and 0.49 for Units 2 and 3. These low ratios (< 1.0) imply that the maximum stress of the BFN steam dryers exceeds the fatigue limit at CLTP for the current plant configuration. TVA indicated in Section 5.3 that the high stress was due to a strong pressure peak identified at 218 Hz. This peak was filtered out of applied time history to dramatically reduce the stresses shown in Table 9B where the minimum stress ratios are all greater than 1.0. TVA indicated that the elimination of 218 Hz peaks can be achieved by plugging eight unused standpipes in main steam lines (MSLs) 'A' and 'D', and four in MSLs 'B' and 'C'. TVA is requested to demonstrate that the plugging of these standpipes eliminates the 218 Hz peak.

**TVA Reply to EMEB.124/91**

In order to mitigate the most limiting component of steam dryer cyclic stress calculated at CLTP conditions in CDI reports 07-05P and 07-06P, Browns Ferry plans to install acoustic vibration suppressors (AVSs) in the eight unused safety relief valve (SRV) standpipe locations on the main steam lines (MSL) which are in the flow stream. The standpipes in the flow stream are located on MSLs A and D only. MSLs B and C have four similar standpipes which are located in dead legs outside the flow stream and would not contribute to the 218 Hz peaks.

As discussed in Section 5.3 of CDI reports 07-05P and 07-06, the dominant component of stress and load occurs at 218 Hz. Steam line data from Units 1 and 2 indicate a strong acoustic response at about 218 Hz. Additionally, accelerometers were installed on some SRV positions in BFN Units 1, 2, and 3 to obtain baseline vibration data during power ascension. This accelerometer data confirms a significant vibration near 220 Hz on all three units.

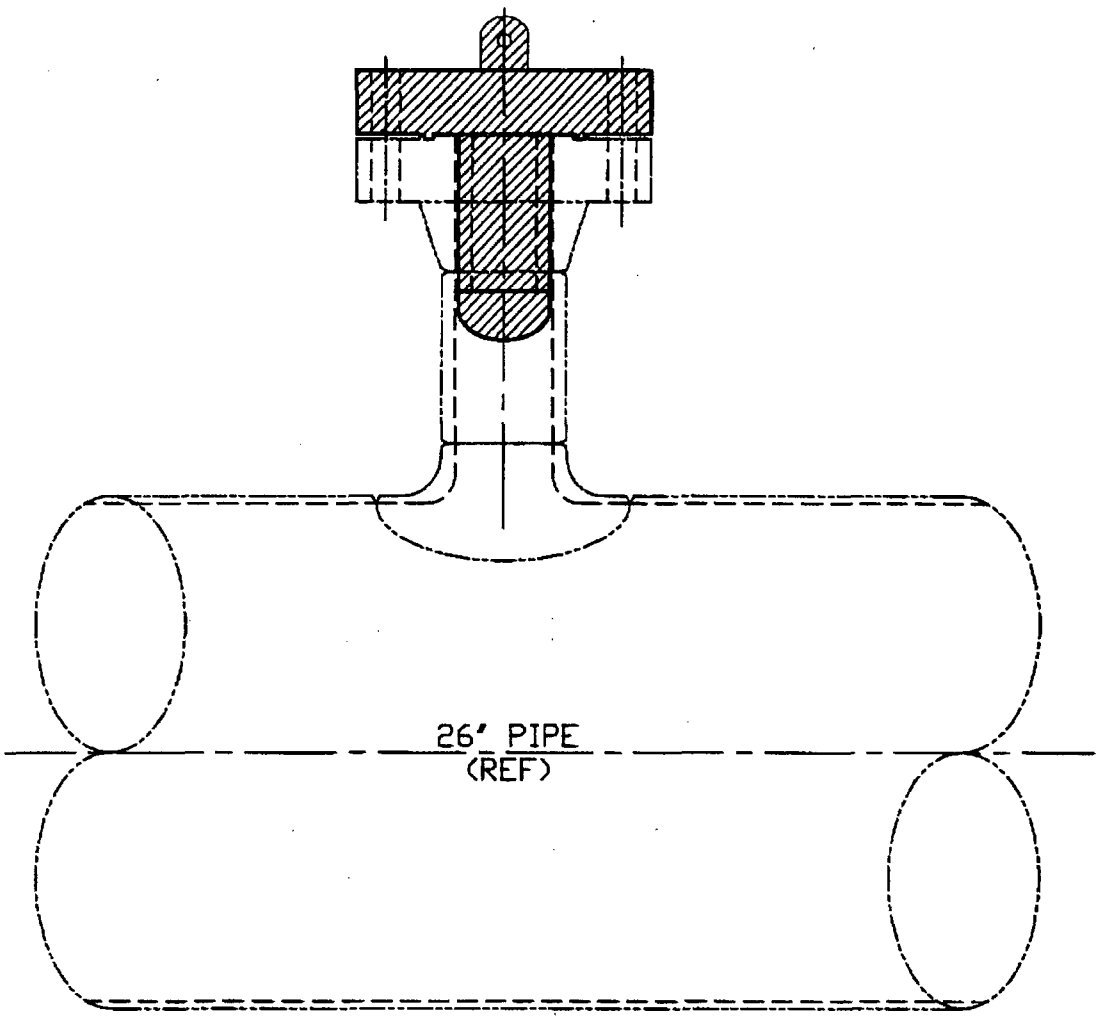
Investigation has identified the unused SRV standpipes as the source of this component. Based on a standpipe length of 20 +/- 0.3 inches from fabrication drawings, the quarter-wave resonant frequency of the standpipe chamber was found to range from 218 to 225 Hz. The flow rate at which the peak responses occurred corresponds to a Strouhal number indicative of the second shear wave instability mode (i.e., vortex shedding mode). The MSL data taken during power ascension indicates a sharp increase in amplitude at the standpipe quarter-wave frequencies at main steam flow rates corresponding to approximately 3.4 Mlb/hr for MSLs A and D. As main steam flow was further increased, the amplitudes of the quarter-wave responses began to decrease. This is very indicative of vortex shedding-induced acoustic resonance, which is strongly dependent on flow velocity.

Based on this investigation, TVA has concluded that the unused SRV standpipes are a significant source of acoustic loading. As such, TVA plans to directly address dryer loading by eliminating the standpipes as a source of excitation. The approach being taken to eliminate the 218 Hz resonance in MSLs A and D is to increase the fundamental acoustic resonant frequencies (i.e., quarter-wave frequencies) of the standpipes by decreasing their effective lengths through the installation of AVSs, so that resonance due to vortex shedding will not occur at main steam flow rates up through EPU conditions. Accordingly, AVS devices will be installed in the eight standpipes in MSLs A and D which are in the flow stream. AVS devices will not be installed in the four unused standpipes on MSLs B and C because these branches are located on the dead-leg portion of the line and are not exposed

to main steam flow. Figure EMEB.124/91-1 is a sketch showing the design of the AVS. An AVS design was performed which includes sensitivity analyses to demonstrate that the fundamental acoustic resonant frequencies of the modified standpipe configurations are sufficiently increased to avoid resonance at all flow rates up through EPU.

Currently, TVA plans to install the AVS devices on BFN Unit 3 during the upcoming Spring 2008 outage. Following startup from the outage, MSL strain gage data will be taken to confirm that the AVS provides the intended effect on the acoustic frequency spectra.

Figure EMEB.124/91-1
Acoustic Vibration Suppressor



**NRC Request EMEB.125/92**

It appears that all three units were analyzed utilizing MSL strain gage data from BFN Unit 2. To assess the applicability of the use of Unit 2 steam line data for the Unit 1 steam dryer stress analysis, a comparison of the Unit 1 and Unit 2 main steam line strain gage data was performed in Enclosure 6, which need to be reviewed in detail. No main steam strain gage data is available for Unit 3. It is noted that, in the public meeting on April 6, 2007, the Nuclear Regulatory Commission staff advised TVA that the application should show the similarity between Units 2 and 3 steam dryers since Unit 3 will not be instrumented by TVA. TVA is requested to demonstrate that Unit 2 MSL strain gage data can be applied to Unit 3 steam dryer stress analysis under EPU conditions.

**TVA Reply to EMEB.125/92**

The BFN steam dryer stress analyses were provided by the July 27, 2007, submittal in CDI Report No. 07-05P (Enclosure 1), "Finite Element Model for Stress Assessment of Browns Ferry Nuclear Unit 1 Steam Dryer to 250 Hz," and CDI Report No. 07-06P (Enclosure 2), "Finite Element Model for Stress Assessment of Browns Ferry Nuclear Unit 2 and 3 Steam Dryers to 250 Hz." Due to the availability of MSL strain gage data and the schedule for performing the BFN steam dryer stress analyses, all three units were analyzed utilizing MSL strain gage data from BFN Unit 2. Unit 2 strain gage data was obtained in October 2006 following a mid-cycle outage. Unit 1 strain gage data was taken during the unit restart from the extended outage during the last half of June 2007.

To assess the applicability of the use of Unit 2 steam line data for the Unit 1 steam dryer stress analysis, a comparison of the Unit 1 and Unit 2 MSL strain gage data was performed. The evaluation was provided by the July 27, 2007, submittal in CDI Technical Memorandum No. 07-26P (Enclosure 6), "Comparison of Browns Ferry Nuclear Unit 1 and Unit 2 Main Steam Line Strain Gage/Pressure Readings." This evaluation concluded that the use of the Unit 2 data for the Unit 1 analysis results in conservative prediction of dryer stresses on Unit 1.

Unit 2 steam line strain gage data was utilized in the stress analyses for all three units based on the similarity between the physical locations of relevant components on all three units. Component as-built locations (not field verified) are provided for each steam line in Table EMEB.125/92-1.

Currently, TVA plans to install steam line strain gages on BFN Unit 3 during the upcoming Spring 2008 outage. Following startup from the outage, MSL strain gage data will be taken to confirm the similarity of acoustic data to Unit 2.

## Table EMEB.125/92-1
## BFN Units 1, 2, and 3 Steam Line Measurements

| Segment # | Item | Unit 1 | | Unit 2 | | Unit 3 | |
|---|---|---|---|---|---|---|---|
| | | Segment span (ft) | Cumulative span (ft) | Segment span (ft) | Cumulative span (ft) | Segment span (ft) | Cumulative span (ft) |
| **Main Steam Line A** | | | | | | | |
| A1 to A2 | Noz to first Ell | 4.000 | 4.000 | 3.833 | 3.833 | 4.000 | 4.000 |
| A2 to A3 | Ell to 5D Bend | 35.792 | 39.792 | 35.375 | 39.208 | 35.395 | 39.395 |
| A3 to A4 | 5D Bend to 2nd Ell | 12.417 | 52.209 | 13.000 | 52.208 | 12.833 | 52.228 |
| A4 to A5 | 2nd Ell to 71ASRV | 2.833 | 55.042 | 2.880 | 55.088 | 2.880 | 55.108 |
| A5 to A6 | 71ASRV to SP | 2.646 | 57.688 | 2.660 | 57.748 | 2.750 | 57.858 |
| A6 to A7 | SP to SP | 4.958 | 62.646 | 4.958 | 62.706 | 5.000 | 62.858 |
| A7 to A8 | Sp to 71MSRV | 3.125 | 65.771 | 3.125 | 65.831 | 3.458 | 66.316 |
| A8 to A9 | 71M SRV to SP | 6.250 | 72.021 | 6.167 | 71.998 | 6.167 | 72.483 |
| A9 to A10 | SP to SP | 3.167 | 75.188 | 3.125 | 75.123 | 3.125 | 75.608 |
| A10 to A11 | SP to 71BSRV | 3.080 | 78.268 | 3.104 | 78.227 | 3.104 | 78.712 |
| A11 to A12 | 71B to 3rd Ell | 7.417 | 85.685 | 7.290 | 85.517 | 7.354 | 86.066 |
| A12 to A13 | 3rd Ell to 4th Ell | 18.416 | 104.101 | 18.390 | 103.907 | 18.500 | 104.566 |
| A13 to A14 | 4th Ell to 1st MSIV | 5.080 | 109.181 | 5.310 | 109.217 | 5.375 | 109.941 |
| A14 to A15 | 1st to 2nd MSIV | 24.604 | 133.785 | 24.680 | 133.897 | 24.559 | 134.500 |
| **Main Steam Line B** | | | | | | | |
| B1 to B2 | Noz to 1st Ell | 3.871 | 3.871 | 4.120 | 4.120 | 4.000 | 4.000 |
| B2 to B3 | 1st Ell to 5D Bend | 35.250 | 39.121 | 35.030 | 39.150 | 35.969 | 39.969 |
| B3 to B4 | 5D Bend to Hdr | 11.330 | 50.451 | 9.790 | 48.940 | 11.167 | 51.136 |
| B4 to B5* | Tee @ Hdr to SP | 3.708 | 54.159 | 3.310 | 52.250 | 3.667 | 54.803 |
| B5 to B6* | SP to SP | 5.042 | 59.201 | 5.270 | 57.520 | 5.083 | 59.886 |
| B6 to HPCI* | SP to HPCI Con | 11.042 | 70.243 | 11.386 | 68.906 | 11.167 | 71.053 |
| HPCI to B7* | HPCI to 71D SRV | 1.500 | 71.743 | 1.265 | 70.171 | 1.500 | 72.553 |
| B7 to B8* | 71D to 71C SRV | 3.313 | 75.056 | 3.790 | 73.961 | 3.417 | 75.970 |

| Segment # | Item | Unit 1 | | Unit 2 | | Unit 3 | |
|---|---|---|---|---|---|---|---|
| | | Segment span (ft) | Cumulative span (ft) | Segment span (ft) | Cumulative span (ft) | Segment span (ft) | Cumulative span (ft) |
| B8 to B9 capped end* | 71C to End Hdr Cap | 1.760 | 76.816 | 2.750 | 76.711 | 1.750 | 77.720 |
| B4 to B10 | Tee @ Hdr Con to 71ESRV | 6.658 | 57.109 | 6.580 | 55.520 | 6.667 | 57.803 |
| B10 to B11 | 71E to 71FSRV | 3.396 | 60.505 | 3.370 | 58.890 | 3.438 | 61.241 |
| B11 to B12 | 71F to 2nd Ell | 7.031 | 67.536 | 7.280 | 66.170 | 7.458 | 68.699 |
| B12 to B13 | 2nd Ell to 3rd Ell | 18.480 | 86.016 | 18.000 | 84.170 | 18.125 | 86.824 |
| B13 to B14 | 3rd Ell to 4th Ell | 4.667 | 90.683 | 4.582 | 88.752 | 4.750 | 91.574 |
| B14 to B15 | 4th Ell to 1st MSIV | 7.211 | 97.894 | 7.050 | 95.802 | 6.850 | 98.424 |
| B15 to B16 | 1st to 2nd MSIV | 23.020 | 120.914 | 22.830 | 118.632 | 22.850 | 121.274 |
| Main Steam Line C | | | | | | | |
| C1 to C2 | Noz to 1st Ell | 4.000 | 4.000 | 3.792 | 3.792 | 4.063 | 4.063 |
| C2 to C3 | 1st Ell to 5D Bend | 34.583 | 38.583 | 34.083 | 37.875 | 34.333 | 38.396 |
| C3 to C4 | 5D Bend to Tee @ Hdr | 12.000 | 50.583 | 12.770 | 50.645 | 12.790 | 51.186 |
| C4 to C5* | Tee @ Hdr to SP | 3.5 | 54.083 | 2.36 | 53.005 | 3.7 | 54.886 |
| C5 to C6* | SP to SP | 5.000 | 59.083 | 5.130 | 58.135 | 5.063 | 59.949 |
| C6 to C7* | Sp to 71H SRV | 13.000 | 72.083 | 12.420 | 70.555 | 12.583 | 72.532 |
| C7 to C8* | 71H to 71G SRV | 3.417 | 75.500 | 3.402 | 73.957 | 3.385 | 75.917 |
| C8 to C9 Capped End* | 71G to Hdr Cap | 1.729 | 77.229 | 1.694 | 75.651 | 1.693 | 77.610 |
| C4 to C10 (RCIC) | Tee to 71JSRV | 9.875 | 60.458 | 8.980 | 59.625 | 10.100 | 61.286 |
| C10 to C11 | 71J to 2nd Ell | 6.583 | 67.041 | 7.547 | 67.172 | 7.541 | 68.827 |
| C11 to C12 | 2nd Ell to 3rd Ell | 18.427 | 85.468 | 18.250 | 85.422 | 18.740 | 87.567 |
| C12 to C13 | 3rd Ell to 4th Ell | 4.375 | 89.843 | 4.580 | 90.002 | 4.580 | 92.147 |
| C13 to C14 | 4th Ell to 1st MSIV | 6.906 | 96.749 | 6.938 | 96.940 | 6.958 | 99.105 |
| C14 to C15 | 1st to 2nd MSIV | 23.604 | 120.353 | 23.750 | 120.690 | 23.646 | 122.751 |

| Segment # | Item | Unit 1 | | Unit 2 | | Unit 3 | |
|---|---|---|---|---|---|---|---|
| | | Segment span (ft) | Cumulative span (ft) | Segment span (ft) | Cumulative span (ft) | Segment span (ft) | Cumulative span (ft) |
| Main Steam Line D | | | | | | | |
| D1 to D2 | Noz to 1st Ell | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 | 4.000 |
| D2 to D3 | 1st Ell to 5D Bend | 35.531 | 39.531 | 35.210 | 39.210 | 35.188 | 39.188 |
| D3 to D4 | 5D Bend to 2nd Ell | 12.417 | 51.948 | 12.970 | 52.180 | 12.500 | 51.688 |
| D4 to D5 | 2nd Ell to 71KSRV | 3.250 | 55.198 | 2.890 | 55.070 | 3.000 | 54.688 |
| D5 to D6 | 71K to SP | 2.677 | 57.875 | 2.685 | 57.755 | 2.750 | 57.438 |
| D6 to D7 | SP to SP | 4.938 | 62.813 | 4.918 | 62.673 | 5.000 | 62.438 |
| D7 to D8 | Sp to 71NSRV | 3.080 | 65.893 | 3.080 | 65.753 | 3.167 | 65.605 |
| D8 to D9 | 71N to SP | 6.125 | 72.018 | 6.196 | 71.949 | 6.208 | 71.813 |
| D9 to D10 | SP to SP | 3.167 | 75.185 | 3.063 | 75.012 | 3.063 | 74.876 |
| D10 to D11 | SP to 71LSRV | 3.040 | 78.225 | 3.104 | 78.116 | 3.125 | 78.001 |
| D11 to D12 | 71LSRV to 3rd Ell | 7.080 | 85.305 | 7.260 | 85.376 | 7.167 | 85.168 |
| D12 to D13 | 3rd Ell to 4th Ell | 18.500 | 103.805 | 18.415 | 103.791 | 17.958 | 103.126 |
| D13 to D14 | 4th Ell to 1st MSIV | 5.145 | 108.950 | 5.365 | 109.156 | 5.489 | 108.615 |
| D14 to D15 | 1st to 2nd MSIV | 24.906 | 133.856 | 25.150 | 134.306 | 24.844 | 133.459 |

*Dead leg locations with no flow

**NRC Request EMEB.126/93**

CDI Report No. 07-09P, *Methodology to Predict Full Scale Steam Dryer Loads from In-Plant Measurements with the Inclusion of a Low Frequency Hydrodynamic Contribution*, in Enclosure 3 of the July 27, 2007, letter provides a methodology for predicting steam dryer loads including a low-frequency hydrodynamic contribution. [[

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**TVA Reply to EMEB.126/93**

No additional data sets are available to TVA to undertake further validation of ACM Rev. 4. TVA's position is that comparison of prediction against the Quad Cities data is favorable. It should be noted that there are low frequency loads present at Quad Cities as demonstrated in Figure 126/93-1 below. [[

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**NRC Request EMEB.127/94**

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**TVA Reply to EMEB.127/94**

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**NRC Request EMEB.128/95**

CDI Report No. 07-10P, *Acoustic and Low Frequency Hydrodynamic Loads at CLTP Power level on Browns Ferry Nuclear Unit 2 Steam Dryer to 250 Hz*, discusses the bias errors and uncertainties of the Acoustic Circuit Model analysis. Discuss how the evaluation focuses on resonance peaks measured at current operating conditions and predicted for EPU conditions when assuming frequency intervals for evaluation of bias error and uncertainty of the ACM analysis.

**TVA Reply to EMEB.128/95**

As shown in Table 5.1 of CDI report 07-10P, the ACM Rev. 4 bias and uncertainty factors for all BFN units are applied at fixed frequency intervals based on correlation of ACM Rev. 4 with QC2 data. The only exception to this is that the total bias and uncertainty factor of 75% applied to the 153 to 157 Hz range for QC2 was shifted to the 216 to 220 Hz range for BFN. The 216 to 220 Hz range coincides with a 218 Hz peak observed in all BFN units and is attributed to unused SRV standpipe acoustic resonance. Even though the BFN analysis considers that this resonance is mitigated by the installation of acoustic vibration suppressors, the 75% total bias and uncertainty factor is still applied in the 216 to 220 Hz band since no other similar resonance has been identified.

**ENCLOSURE 3**

**TENNESSEE VALLEY AUTHORITY**
**BROWNS FERRY NUCLEAR PLANT (BFN)**
**UNITS 1, 2, AND 3**

**TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 - EXTENDED POWER UPRATE (EPU) - STEAM DRYER ANALYSIS REVIEW**

**AFFIDAVIT**

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Attached is CDI's affidavit for the proprietary information contained in the response to preliminary findings on steam dryer stress analysis provided in Enclosure 1.

Continuum Dynamics, Inc.
(609) 538-0444 (609) 538-0464 fax 34 Lexington Avenue Ewing, NJ 08618-2302

**AFFIDAVIT**

Re: Browns Ferry Nuclear Plant (BFN) - Units 1, 2 and 3 - Technical Specifications (TS) Changes TS-431 and TS-418 - Extended Power Uprate (EPU) - Response to Preliminary Findings on Steam Dryer Stress Analysis

I, Alan J. Bilanin, being duly sworn, depose and state as follows:

1. I hold the position of President and Senior Associate of Continuum Dynamics, Inc. (hereinafter referred to as C.D.I.), and I am authorized to make the request for withholding from Public Record the Information contained in the documents described in Paragraph 2. This Affidavit is submitted to the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 2.390(a)(4) based on the fact that the attached information consists of trade secret(s) of C.D.I. and that the NRC will receive the information from C.D.I. under privilege and in confidence.

2. The Information sought to be withheld, as transmitted to TVA Browns Ferry as attachment to C.D.I. Letter No. 07212 dated 19 November 2007 "Browns Ferry Nuclear Plant (BFN) - Units 1, 2 and 3 - Technical Specifications (TS) Changes TS- 431 and TS-418 Extended Power Uprate (EPU) - Response to Preliminary Findings on Steam Dryer Stress Analysis".

3. The Information summarizes:

   (a) a process or method, including supporting data and analysis, where prevention of its use by C.D.I.'s competitors without license from C.D.I. constitutes a competitive 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 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 3(a), 3(b) and 3(c) above.

4. The Information has been held in confidence by C.D.I., its owner. The Information has consistently been held in confidence by C.D.I. and no public disclosure has been made and it is not available to the public. All disclosures to

third parties, which have been limited, have been made pursuant to the terms and conditions contained in C.D.I.'s Nondisclosure Secrecy Agreement which must be fully executed prior to disclosure.

5. The Information is a type customarily held in confidence by C.D.I. and there is a rational basis therefore. The Information is a type, which C.D.I. considers trade secret and is held in confidence by C.D.I. because it constitutes a source of competitive advantage in the competition and performance of such work in the industry. Public disclosure of the Information is likely to cause substantial harm to C.D.I.'s competitive position and foreclose or reduce the availability of profit-making opportunities.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to be the best of my knowledge, information and belief.

Executed on this 19th day of November 2007.

Alan J. Bilanin
Continuum Dynamics, Inc.

Subscribed and sworn before me this day: 11-19-2007

Eileen P. Burmeister, Notary Public

EILEEN P. BURMEISTER
NOTARY PUBLIC OF NEW JERSEY
MY COMM. EXPIRES MAY 6, 2012