PROPRIETARY INFORMATION

Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

December 20, 2002

TVA-BFN-TS-420

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 No. 50-260
Tennessee Valley Authority)

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 2 - TECHNICAL SPECIFICATIONS (TS) CHANGE 420 - SAFETY LIMIT MINIMUM CRITICAL POWER RATIO (SLMCPR) - CYCLE 13 OPERATION - SUPPLEMENTAL INFORMATIONAL

By letter dated October 25, 2002, the Tennessee Valley Authority (TVA) submitted a TS change request (TS-420) for BFN Unit 2 to revise the numeric value of SLMCPR in TS 2.1.1.2 for two recirculation loop operation to incorporate the results of the cycle-specific core reload analysis for Cycle 13 operation. Subsequently, the Unit 2 Cycle 13 core loading design and bundle design has been modified to increase the beginning of cycle shutdown margin. The redesign does not affect the calculated SLMPCR for Cycle 13 operation, but does change several parameters in the supporting information that was provided in Enclosures 3 and 4 of TS-420. Accordingly, updated supporting information is being provided by this letter as Enclosures 1 and 2. These two enclosures supersede Enclosures 3 and 4 of the October 25, 2002, TS-420 submittal.

PROPRIETARY INFORMATION IN ENCLOSURE 2

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A non-proprietary version of a letter report prepared by Global Nuclear Fuels (GNF) in support of this supplemental information is provided in Enclosure 1. Enclosure 2 provides a proprietary version of the same report. GNF has requested that the proprietary report be withheld from public disclosure pursuant to 10 CFR 2.790. In consideration, an affidavit as required by 10 CFR 2.790(b)(1) is also included in Enclosure 2.

TVA has reviewed the no significant hazards consideration for TS-420 submitted on October 25, 2002, and concluded it remains valid for the addition of this supplemental information. Similarly, the categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9) continues to be valid. In accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Alabama State Department of Public Health.

There are no regulatory commitments associated with this submittal. This letter is being sent in accordance with NRC Regulatory Issue Summary 2001-05, Guidance on Submitting Documents to the NRC by Electronic Information Exchange or on CD-ROM. If you have any questions about TS-420 or this supplemental information, please contact me at (256)729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 20, 2002.

Sincerely,

T. E. Abney
Manager of Licensing
and Industry Affairs

Enclosures:
1. Non-proprietary Version of GNF Letter
2. Affidavit and Proprietary Version of GNF Letter

TVA cc: See page 3

Enclosures
cc (Enclosures):
State Health Officer
Alabama State Department of Public Health
RSA Tower - Administration
Suite 1552
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Enclosure 1

Technical Specifications (TS) Change 420
Safety Limit Minimum Critical Power Ratio (SLMCPR)
Unit 2 Cycle 13 Operation

Non-proprietary Version of GNF Letter

References

[1] Letter, Frank Akstulewicz (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, *Methodology and Uncertainties for Safety Limit MCPR Evaluations*; NEDC-32694P, *Power Distribution Uncertainties for Safety Limit MCPR Evaluation*; and Amendment 25 to NEDE-24011-P-A on Cycle Specific Safety Limit MCPR," (TAC Nos. M97490, M99069 and M97491), March 11, 1999.

[2] Letter, Thomas H. Essig (NRC) to Glen A. Watford (GE), "Acceptance for Referencing of Licensing Topical Report NEDC-32505P, Revision 1, *R-Factor Calculation Method for GE11, GE12 and GE13 Fuel*," (TAC Nos. M99070 and M95081), January 11, 1999.

[3] *General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application*, NEDO-10958-A, January 1977.

[4] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to R. Pulsifer (NRC), "Confirmation of 10x10 Fuel Design Applicability to Improved SLMCPR, Power Distribution and R-Factor Methodologies", FLN-2001-016, September 24, 2001.

[5] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to J. Donoghue (NRC), "Confirmation of the Applicability of the GEXL14 Correlation and Associated R-Factor Methodology for Calculating SLMCPR Values in Cores Containing GE14 Fuel", FLN-2001-017, October 1, 2001.

[6] Letter, Glen A. Watford (GNF-A) to U. S. Nuclear Regulatory Commission Document Control Desk with attention to J. Donoghue (NRC), "Final Presentation Material for GEXL Presentation – February 11, 2002", FLN-2002-004, February 12, 2002.

Comparison of Browns Ferry Unit 2 Cycle 13 SLMCPR Value

Table 1 summarizes the relevant input parameters and results of the safety limit MCPR (SLMCPR) determination for the Browns Ferry Unit 2 Cycle 13 and Cycle 12 cores. The SLMCPR evaluations were performed using NRC approved methods and uncertainties[1].

These calculations use the GEXL14 correlation for GE14 fuel. [[ ]]. The details of the evaluation are provided in Table 2. [[ ]] the value at EOC; however, the calculated SLMCPR at BOC is the limiting value for this cycle. [[ ]] The DLO and SLO SLMCPR values calculated for Cycle 13 of Browns Ferry Unit 2 are shown in Table 1. Other quantities that have been shown to have some impact on the determination of the SLMCPR are also shown in Table 1.

[[ ]]

In comparing the Browns Ferry Unit 2 Cycle 13 and Cycle 12 SLMCPR values it is important to note the impact of the differences in the core and bundle designs. These differences are summarized in Table 1.

In general, the calculated safety limit is dominated by two key parameters: (1) flatness of the core bundle-by-bundle MCPR distributions and (2) flatness of the bundle pin-by-pin power/R-factor distributions. Greater flatness in either parameter yields more rods susceptible to boiling transition and thus a higher calculated SLMCPR.

[[ ]]

The uncontrolled bundle pin-by-pin power distributions were compared between the Browns Ferry Unit 2 Cycle 13 bundles and the Cycle 12 bundles. Pin-by-pin power distributions are characterized in terms of R-factors using the NRC approved methodology[2]. For the Browns Ferry Unit 2 Cycle 13 limiting case analyzed at BOC, [[ ]] the Browns Ferry Unit 2 Cycle 12 bundles are flatter than the bundles used for the Cycle 13 SLMCPR analysis.

The net impact of these effect [[ ]] predicts that the Cycle 13 SLMCPR should be 0.005 lower than the SLMCPR calculated for Cycle 12. However, this prediction presumes a normal distribution for the rod CPRs. The approved Monte Carlo calculation accounts for a skewed rod CPR distribution that results in a higher calculated SLMCPR. As indicated in Table 1, the NRC-approved[1] reduced power distribution uncertainties have been applied for the Browns Ferry Unit 2 Cycle 13 analyses. These reduced power distribution uncertainties were also included in the previous SLMCPR calculation for Browns Ferry Unit 2 Cycle 12 and do not constitute a change for the new operating cycle.

The revised power distribution model and reduced uncertainties associated with 3D Monicore have been justified, reviewed and approved by the NRC (reference NEDC-32601P-A and NEDC-32694P-A). The conservatism that remains even when applying the revised model and reduced uncertainties to calculate a lower SLMCPR was documented as part of the NRC review and approval. It was noted on page A-24 of NEDC-32601P-A [[ ]]

Summary

[[ ]] have been used to compare quantities that impact the calculated SLMCPR value. Based on these comparisons, the conclusion is reached that the Browns Ferry Unit 2 Cycle 12 core/cycle has a flatter core MCPR distribution [[ ]] than what was used to perform the Cycle 13 SLMCPR evaluation; and the Browns Ferry Unit 2 Cycle 12 core/cycle has a flatter in-bundle power distributions [[ ]] than what was used to perform the Cycle 13 SLMCPR evaluation.

The calculated 1.08 Monte Carlo SLMCPR for Browns Ferry Unit 2 Cycle 13 is conservative relative to what one would expect [[ ]] The 1.08 SLMCPR value is based on the approved Monte Carlo methodology using the reduced uncertainties given in NEDC-32601P-A and NEDC-32694P-A.

For single loop operations (SLO) the calculated safety limit MCPR for the limiting case is 1.10 as determined by specific calculations for Browns Ferry Unit 2 Cycle 13. The limiting value for SLO occurs at BOC. A top-peaked power shape does not exist at BOC.

[[ ]]

Supporting Information

The following information is provided in response to NRC questions on similar submittals regarding changes in Technical Specification values of SLMCPR. NRC questions pertaining to how GE14 applications satisfy the conditions of the NRC SER[1] have been addressed in Reference [4]. Other generically applicable questions related to application of the GEXL14 correlation and the applicable range for the R-factor methodology are addressed in Reference [5]. Only those items that require a plant/cycle specific response are presented below since all the others are contained in the references that have already been provided to the NRC.

The core loading information for Browns Ferry Unit 2 Cycle 13 is provided in Figure 1. For comparison the core loading information for Browns Ferry Unit 2 Cycle 12 is provided in Figure 2. The impact of the fuel loading pattern differences on the calculated SLMCPR is correlated to the values of [[ ]]

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Verified by:

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Table 1

Comparison of the Browns Ferry Unit 2 Cycle 13 and Cycle 12 SLMCPR

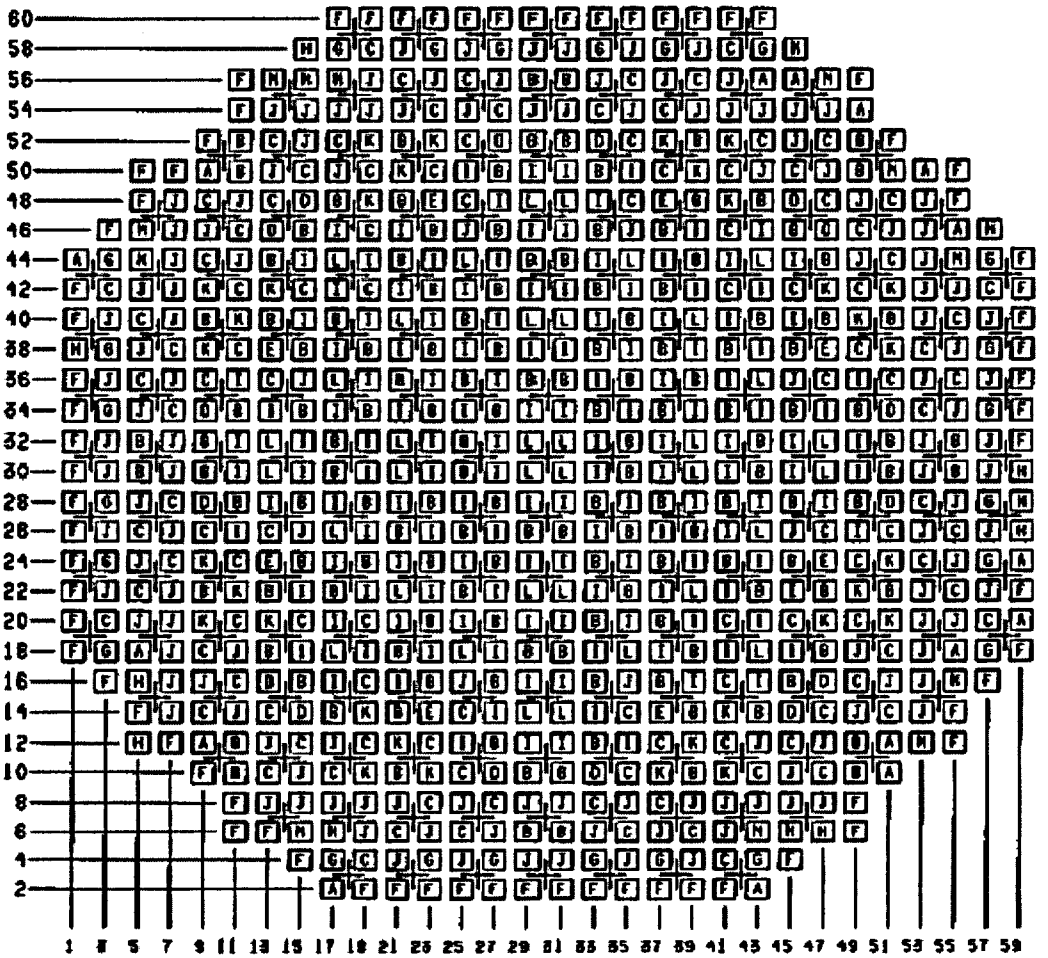
QUANTITY, DESCRIPTION	Browns Ferry Unit 2 Cycle 12	Browns Ferry Unit 2 Cycle 13
Number of Bundles in Core	764	764
Limiting Cycle Exposure Point	EOC	BOC
Cycle Exposure at Limiting Point [MWd/ST]	12,800 (EOC-1250)	200
Reload Fuel Type	GE13	GE14
Latest Reload Batch Fraction [%]	33.5%	48.7%
Latest Reload Average Batch Weight % Enrichment	4.00%	3.76%
Batch Fraction for GE14	0.0%	48.7%
Batch Fraction for GE13	100.0	36.6%
Batch Fraction for GE11	0.0%	14.7%
Core Average Weight % Enrichment	3.97%	3.83%
Core MCPR (for limiting rod pattern)	1.37	1.44
[[		]]
[[		]]
[[		]]
Power distribution methodology	Revised NEDC-32601P-A	Revised NEDC-32601P-A
Power distribution uncertainty	Reduced NEDC-32694P-A	Reduced NEDC-32694P-A
Non-power distribution uncertainty	Revised NEDC-32601P-A	Revised NEDC-32601P-A
Calculated Safety Limit MCPR (DLO)	**1.07**	**1.08**
Calculated Safety Limit MCPR (SLO)	**1.10**	**1.10**

Table 2

Net Adjustment to SLMCPR to Account for Top-Peaked Power Shapes

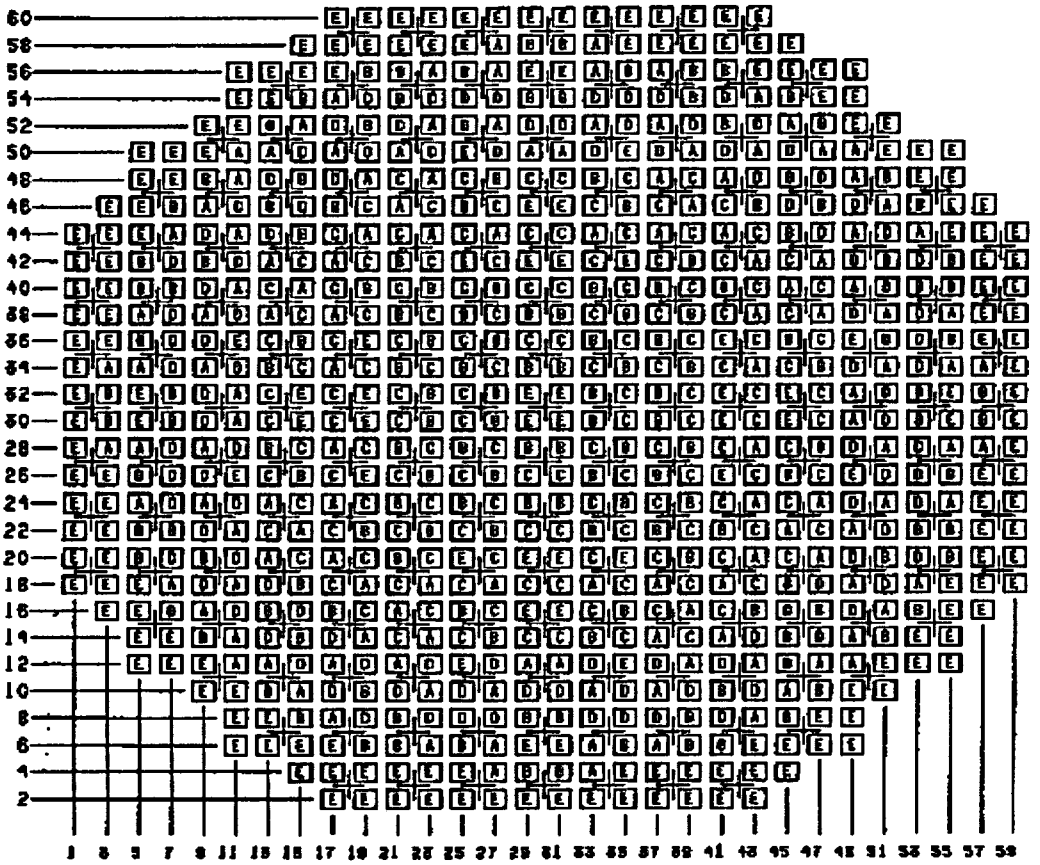
Step		Dual Loop Ops.			Single Loop Ops.
		BOC	MOC	EOC	BOC
	Calculated M/C SLMCPR	[[			]]
2,3	[[				]]
4	Credit for Reduced Uncertainties	[[			]]
	[[				]]
	Adjusted SLMCPR with rounding	1.08	1.05	1.07	1.10
	SLMCPR for Tech Spec Submittal	DLO 1.08			SLO 1.10
Step 5 credit applies only for OLMCPR and is not relevant for Tech Specs under review					

Figure 1 Reference Core Loading Pattern – Cycle 13



Fuel ID	Cycle Loaded	Quantity	Bundle Description	Fuel ID	Cycle Loaded	Quantity	Bundle Description
A	9	16	GE11-P9HUB366-12G4.0-100T-146-T	H	9	8	GE11-P9HUB367-14GZ-100T-146-T
B	12	144	GE13-P9DTB391-13GZ-100T-146-T-2430	I	13	144	GE14-P10DNAB367-14GZ-100T-150-T-2602
C	12	112	GE13-P9DTB412-2G7.0/11G5.0-100T-146-T-2431	J	13	136	GE14-P10DNAB416-16GZ-100T-150-T-2601
D	13	16	GE14-P10DNAB416-18GZ-100T-150-T-2627	K	13	32	GE14-P10DNAB416-16GZ-100T-150-T-2600
E	13	8	GE14-P10DNAB417-18GZ-100T-150-T-2628	L	13	36	GE14-P10DNAB200-3GZ-100T-150-T-2603
F	9	72	GE11-P9HUB366-12G4.0-100T-146-T	M	9	16	GE11-P9HUB367-14GZ-100T-146-T
G	10	24	GE13-P9HTB384-12G4.0-100T-146-T				

Figure 2 Reference Core Loading Pattern – Cycle 12



Fuel Identifier	Cycle Loaded	Quantity	Bundle Description
A	11	140	GE13-P9DTB406-13GZ-100T-146
B	11	160	GE13-P9DTB401-14GZ-100T-146
C	12	144	GE13-P9DTB391-13GZ-100T-146
D	12	112	GE13-P9DTB412-2G7.0/11G5.0-100T-146
E	10	208	GE13-P9HTB384-12G4.0-100T-146

Enclosure 2

Technical Specifications (TS) Change 420
Safety Limit Minimum Critical Power Ratio (SLMCPR)
Unit 2 Cycle 13 Operation

Affidavit and Proprietary Version of GNF Letter

Affidavit

I, Jens G. Andersen, state as follows:

(1) I am Fellow and project manager, TRACG Development, Global Nuclear Fuel – Americas, L.L.C. ("GNF-A") 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 the attachment, "Additional Information Regarding the Cycle Specific SLMCPR for Browns Ferry Unit 2 Cycle 13," December 16, 2002.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, GNF-A 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 2.790(a)(4) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information," and some portions also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by GNF-A's competitors without license from GNF-A constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of GNF-A, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future GNF-A customer–funded development plans and programs, of potential commercial value to GNF-A;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GNF-A, and is in fact so held. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in (6) and (7) following. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GNF-A, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge, or subject to the terms under which it was licensed to GNF-A. Access to such documents within GNF-A is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GNF-A are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2) is classified as proprietary because it contains details of GNF-A's fuel design and licensing methodology.

The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost, on the order of several million dollars, to GNF-A or its licensor.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GNF-A's competitive position and foreclose or reduce the availability of profit–making opportunities. The fuel design and licensing methodology is part of GNF-A'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 GNF-A or its licensor.

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.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A 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 GNF-A 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 GNF-A 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 at Wilmington, North Carolina, this 16 day of December, 2002.

Jens G. Andersen
Global Nuclear Fuel – Americas, LLC