



FirstEnergy Nuclear Operating Company

Perry Nuclear Power Plant
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January 30, 2003
PY-CEI/NRR-2665L

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
License Amendment Request Pursuant to 10CFR50.90: Revision of the Minimum Critical Power Ratio (MCPR) Safety Limit

Ladies and Gentlemen:

Nuclear Regulatory Commission (NRC) review and approval of a license amendment for the Perry Nuclear Power Plant (PNPP) is requested. The proposed amendment would modify the existing Minimum Critical Power Ratio (MCPR) Safety Limit contained in Technical Specification 2.1.1.2. Specifically, the change modifies the MCPR Safety Limit values, as calculated by Global Nuclear Fuel (GNF), by decreasing the limit for two recirculation loop operation from 1.10 to 1.07, and decreasing the limit for single recirculation loop operation from 1.11 to 1.08. The change resulted from the core reload analysis performed for the PNPP Fuel Cycle 10.

Approval of the license amendment is requested prior to May 1, 2003, with the amendment being implemented prior to restart from Refueling Outage 9 and within 90 days following the effective date of the amendment. The current MCPR Safety Limit values are conservative when compared with the proposed values. If necessary, PNPP will operate under the current MCPR Safety Limit until the proposed change is NRC approved and implemented by the site.

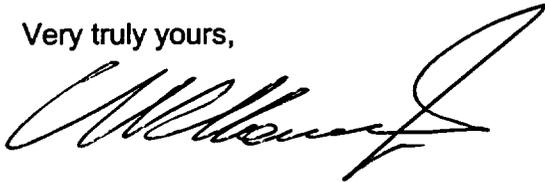
The GNF report detailing the development of the proposed PNPP MCPR Safety Limit values is attached as both a proprietary and non-proprietary version. GNF considers proprietary information to be controlled pursuant to 10 CFR 2.790(a)(4). Therefore, an affidavit requesting that GNF proprietary information be withheld from disclosure is also attached.

Attachment 6 contains Proprietary Information as described in 10 CFR 2.790(a)(4). Upon separation of Attachment 6, this letter may be decontrolled.

APOI

There are no regulatory commitments included in this letter or its attachments. If you have questions or require additional information, please contact Mr. Vernon K. Higaki, Manager - Regulatory Affairs, at (440) 280-5294.

Very truly yours,

A handwritten signature in black ink, appearing to be 'M. Higaki', written in a cursive style.

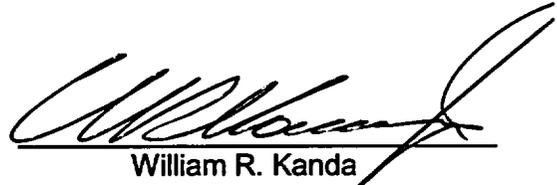
Attachments:

1. Notarized FirstEnergy Nuclear Operating Company Affidavit
2. Description, Background, Technical Analysis, Regulatory Analysis, and Environmental Consideration for the Proposed Technical Specification Change
3. Significant Hazards Consideration
4. Technical Specification Page Annotated with Proposed Change
5. GNF Non-proprietary Report
6. GNF Proprietary Report
7. GNF Affidavit

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III
State of Ohio

Attachment 6 contains Proprietary Information as described in 10 CFR 2.790(a)(4). Upon separation of Attachment 6, this letter may be decontrolled.

I, William R. Kanda, hereby affirm that (1) I am Vice President - Perry, of the FirstEnergy Nuclear Operating Company, (2) I am duly authorized to execute and file this certification as the duly authorized agent for The Cleveland Electric Illuminating Company, Toledo Edison Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.



William R. Kanda

Subscribed to and affirmed before me, the 30th day of January, 2003



JANE E. MOTT
Notary Public, State of Ohio
My Commission Expires Feb. 20, 2005
(Recorded in Lake County)

1.0 DESCRIPTION

This License Amendment Request proposes to modify the Minimum Critical Power Ratio (MCPR) Safety Limit values contained in Technical Specification (TS) 2.1.1.2, for Fuel Cycle 10. The MCPR Safety Limit value for two recirculation loop operation will be changed from 1.10 to 1.07, and the single recirculation loop operation value will be changed from 1.11 to 1.08.

2.0 PROPOSED TECHNICAL SPECIFICATION CHANGE

Technical Specification 2.1.1, "Reactor Core Safety Limits", will be changed by revising Section 2.1.1.2 to read:

"With the reactor steam dome pressure \geq 785 psig and core flow \geq 10% rated core flow:

MCPR shall be \geq 1.07 for two recirculation loop operation or \geq 1.08 for single recirculation loop operation."

The proposed change will be implemented prior to restart from Refueling Outage 9 and will be applicable for the duration of Fuel Cycle 10.

3.0 BACKGROUND

The MCPR Safety Limit is one of the limits used to protect the nuclear fuel. Since the parameters that result in fuel damage are not directly observable during reactor operation, the thermal and hydraulic conditions that result in the onset of transition boiling (i.e., MCPR = 1.00) have been used to mark the beginning of the region in which fuel damage could occur. Although it is recognized that the onset of transition boiling would not result in damage to Boiling Water Reactor (BWR) fuel rods, the critical power at which boiling transition is calculated to occur has been adopted as a convenient limit. The Safety Limit is defined as the critical power ratio in the limiting fuel assembly for which more than 99.9% of the fuel rods in the core are expected to avoid boiling transition, considering the power distribution within the core and various uncertainties. The MCPR Safety Limit provides a 95% probability at the 95% confidence level that following any abnormal operating occurrence, greater than 99.9% of the fuel rods avoid the boiling transition.

4.0 TECHNICAL ANALYSIS

The proposed PNPP MCPR Safety Limit values (proposed to be set at 1.07 for two recirculation loop operation and 1.08 for single recirculation loop operation for PNPP Fuel Cycle 10) were determined using the NRC approved methods detailed in Amendment 25 to NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)", and several other NRC approved General Electric documents, which are incorporated by reference into GESTAR II.

The PNPP-specific evaluation for the Fuel Cycle 10 core reload resulted in different calculated MCPR Safety Limit values because different inputs were used, due to differences in the core design and bundle distribution (e.g., fuel distribution and enrichment) used between Fuel Cycles 9 and 10.

The input parameters and the results of the Global Nuclear Fuel – Americas, LLC (GNF) calculations for the PNPP MCPR Safety Limit values are attached. Attachment 5 provides the non-proprietary version of the GNF document. Attachment 6 provides the proprietary version of the GNF document. A GNF affidavit requesting the withholding of disclosure of the proprietary information contained in Attachment 6 is provided in Attachment 7. Attachments 5 and 6 provide maps showing the Reference Loading Pattern for Fuel Cycles 9 and 10 for comparison.

For Fuel Cycle 10, PNPP has changed from using Revision 10 to Revision 11 of the PANACEA Computer Code (including PANACEA's supporting computer codes). PANACEA is a portion of the methodology described within GESTAR II. PANACEA, Revision 11 has been approved by the NRC as detailed in GESTAR II, Amendment 25. Use of PANACEA Revision 11 resulted in a slight change in the fuel type nomenclature listed in the keys to the Reference Loading Pattern Figures for Cycles 9 and 10 contained in Attachments 5 and 6. The changes are to the alpha numeric characters following the number "150." In Cycle 9, the characters subsequent to "150" were either "T" or "T-XXXX." In Cycle 10, the characters subsequent to "150" are either "T6" or "T6-XXXX." The "T6" designator indicates the use of PANACEA, Revision 11.

This change maintains the fuel margins of safety as described in the PNPP Updated Safety Analysis Report (USAR) and GESTAR II.

5.0 REGULATORY ANALYSIS

SIGNIFICANT HAZARDS CONSIDERATION

The Significant Hazards Consideration for the proposed Technical Specification change is contained in Attachment 3.

6.0 ENVIRONMENTAL CONSIDERATION

The proposed Technical Specification change request was evaluated against the criteria of 10 CFR 51.22 for environmental considerations. The proposed change does not significantly increase individual or cumulative occupational radiation exposures, does not significantly change the types or significantly increase the amounts of effluents that may be released offsite, and as discussed in Attachment 3, does not involve a significant hazards consideration. Based on the foregoing, it has been concluded that the proposed Technical Specification change meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

SIGNIFICANT HAZARDS CONSIDERATION

The proposed amendment is requesting Nuclear Regulatory Commission review and approval of changes to the Perry Nuclear Power Plant (PNPP) Technical Specifications which revises Technical Specification 2.1.1, "Reactor Core Safety Limits." The proposed changes are the Minimum Critical Power Ratio (MCPR) Safety Limit value for two recirculation loop operation will be reduced from 1.10 to 1.07, and the value for single recirculation loop operation will be reduced from 1.11 to 1.08.

The standards used to arrive at a determination that a request for amendment involves no significant hazards considerations are included in the Nuclear Regulatory Commission's regulation, 10 CFR 50.92, which states that the operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any previously evaluated; or (3) involve a significant reduction in a margin of safety.

The proposed amendment has been reviewed with respect to these three factors, and it has been determined that the proposed change does not involve a significant hazard because:

1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

PNPP Updated Safety Analysis Report (USAR) Section 4.2, "Fuel System Design", states the PNPP fuel system design bases are provided in the General Electric Topical Report, NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)." The Minimum Critical Power Ratio (MCPR) Safety Limit is one of the limits used to protect the fuel in accordance with the design basis. The MCPR Safety Limit establishes a margin to the onset of transition boiling. The basis of the MCPR Safety Limit remains the same, ensuring that greater than 99.9% of all fuel rods in the core avoid transition boiling. The methodology used to determine the MCPR Safety Limit values is contained within GESTAR II and is NRC approved. The change does not result in any physical plant modifications or physically affect any plant components. As a result, there is no increase in the probability of occurrence of a previously analyzed accident.

The fundamental sequences of accidents and transients have not been altered. The Safety Limit MCPR is established to avoid fuel damage in response to anticipated operational occurrences. Compliance with a MCPR Safety Limit greater than or equal to the calculated value will ensure that less than 0.1% of the fuel rods will experience boiling transition. This in turn ensures fuel damage does not occur following transients due to excessive thermal stresses on the fuel cladding. The MCPR Operating Limits are set higher (i.e., more conservative) than the Safety Limit such that potentially limiting plant transients prevent the MCPR from decreasing below the MCPR Safety Limit during the transient. Therefore, there is no impact on any of the limiting USAR Appendix 15B transients. The radiological consequences remain the same as previously stated in the USAR. Therefore, the consequences of an accident do not increase over previous evaluations in the USAR.

2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The MCPR Safety Limit basis is preserved, which is to ensure that transition boiling does not occur in at least 99.9% of the fuel rods in the core as a result of the postulated limiting transient. The values are calculated in accordance with GESTAR II. The GESTAR II analyses have been accepted by the NRC. The MCPR Safety Limit is one of the limits established to ensure the fuel is protected in accordance with the design basis. The function, location, operation, and handling of the fuel remain unchanged. No changes in the design of the plant or the method of operating the plant are associated with these revised safety limit values. Therefore, no new or different kind of accident from any previously evaluated is created.

3. The proposed change does not involve a significant reduction in a margin of safety.

This change revises the PNPP MCPR Safety Limit values. The new MCPR Safety Limit values reflect changes due to the Cycle 10 core reload, but do not alter the design or function of any plant system, including the fuel. The new MCPR Safety Limit values were calculated using NRC-approved methods described in GESTAR II. The proposed MCPR Safety Limit values continue to satisfy the fuel design safety criteria which ensures that transition boiling does not occur in at least 99.9% of the fuel rods in the core as a result of the postulated limiting transient. Therefore, the proposed values for the MCPR Safety Limit do not involve a significant reduction in the margin of safety.

Based upon the reasoning presented above, the requested change does not involve a significant hazards consideration.

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be \leq 23.8% RTP.

2.1.1.2 With the reactor steam dome pressure \geq 785 psig and core flow \leq 10% rated core flow:

MCPR shall be \geq 1.10 for two recirculation loop operation or \geq 1.11 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be \leq 1325 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed within 2 hours:

2.2.1 Restore compliance with all SLs; and

2.2.2 Insert all insertable control rods.

**Attachment 5 follows this page, and
contains Non-Proprietary Information.**

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 No. 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 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.

Comparison of Perry Unit 1 SLMCPR Values for Cycles 10 and 9

Table 1 summarizes the relevant input parameters and results of the SLMCPR determination for the Perry Unit 1 Cycle 10 and 9 cores. The SLMCPR evaluations were performed using NRC approved methods and uncertainties^[1]. These evaluations yield different calculated SLMCPR values because different inputs were used. The quantities that have been shown to have some impact on the determination of the safety limit MCPR (SLMCPR) are provided.

In comparing the Perry Unit 1 Cycle 10 and Cycle 9 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 Perry Unit 1 Cycle 10 bundles and the Cycle 9 bundles. Pin-by-pin power distributions are characterized in terms of R-factors using the NRC approved methodology^[2]. For the Perry Unit 1 Cycle 10 limiting case analyzed at EOC, [[[]] the Perry Unit 1 Cycle 10 bundles are more peaked than the bundles used for the Cycle 9 SLMCPR analysis.

Summary

[[]] have been used to compare quantities that impact the calculated SLMCPR value. Based on these comparisons, the conclusion is reached that the Perry Unit 1 Cycle 10 core/cycle has a more peaked core MCPR distribution [[]] than what was used to perform the Cycle 9 SLMCPR evaluation; and the Perry Unit 1 Cycle 10 core/cycle has a more peaked in-bundle power distributions [[]] than what was used to perform the Cycle 9 SLMCPR evaluation.

The calculated 1.07 Monte Carlo SLMCPR for Perry Unit 1 Cycle 10 is consistent with what one would expect [[]] the 1.07 SLMCPR value is appropriate.

Based on all of the facts, observations and arguments presented above, it is concluded that the calculated SLMCPR value of 1.07 for the Perry Unit 1 Cycle 10 core is appropriate. It is reasonable that this value is smaller than the 1.10 value calculated for the previous cycle.

For single loop operations (SLO) the calculated safety limit MCPR for the limiting case is 1.08 as determined by specific calculations for Perry Unit 1 Cycle 10.

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 Perry Unit 1/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 Perry Unit 1 Cycles 9 and 10 is provided in Figures 1 and 2, respectively. The impact of the fuel loading pattern differences on the calculated SLMCPR is correlated to the values of [[]]

The power and non-power distribution uncertainties that are used in the analyses are indicated in Table 1. The referenced document numbers have previously been reviewed and approved by the NRC.

Prepared by:



J.E. Fawks
Technical Program Manager
Perry Unit 1 Project

Verified by:



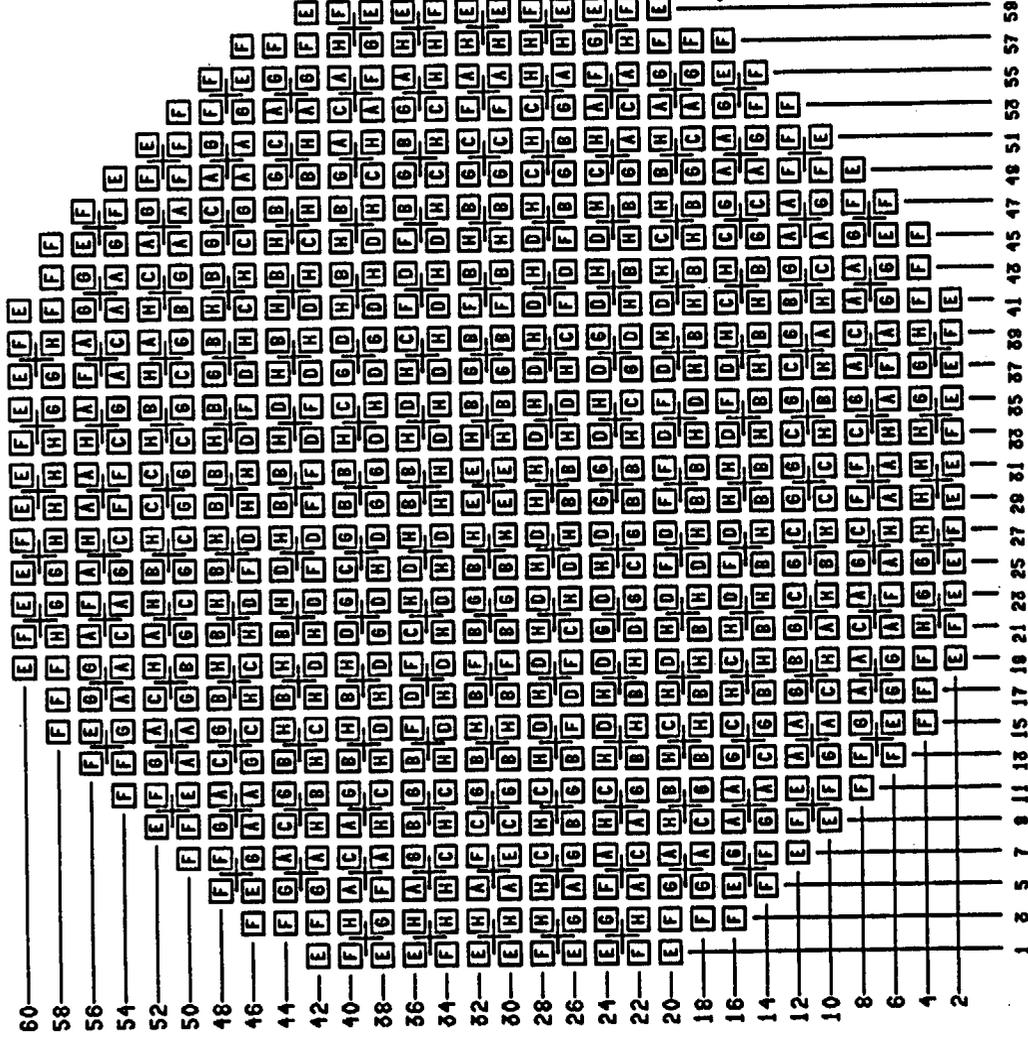
G.N. Marrotte
Technical Program Manger

Table 1

Comparison of the Perry Unit 1 Cycle 9 and Cycle 10 SLMCPR

QUANTITY, DESCRIPTION	Perry Unit 1 Cycle 9	Perry Unit 1 Cycle 10
Number of Bundles in Core	748	748
Limiting Cycle Exposure Point	EOC	EOC
Cycle Exposure at Limiting Point [MWd/STU]	14500	13800
Reload Fuel Type	GE14	GE14
Latest Reload Batch Fraction [%]	40.6	37.4
Latest Reload Average Batch Weight % Enrichment	4.16	4.13
Batch Fraction for GE14	40.6%	78.1%
Batch Fraction for GE12	59.4%	21.9%
Batch Fraction for GE11	0.0%	0.0%
Batch Fraction for GE10	0.0%	0.0%
Core Average Weight % Enrichment	4.0%	4.1%
Core MCPR (for limiting rod pattern)	1.37	1.36
[[]]
[[]]
Power distribution uncertainty	GETAB NEDO-10958-A	GETAB NEDO-10958-A
Non-power distribution uncertainty	Revised NEDC-32694P-A	Revised NEDC-32694P-A
Calculated Safety Limit MCPR	1.10	1.07

Figure 1 Reference Core Loading Pattern - Cycle 9



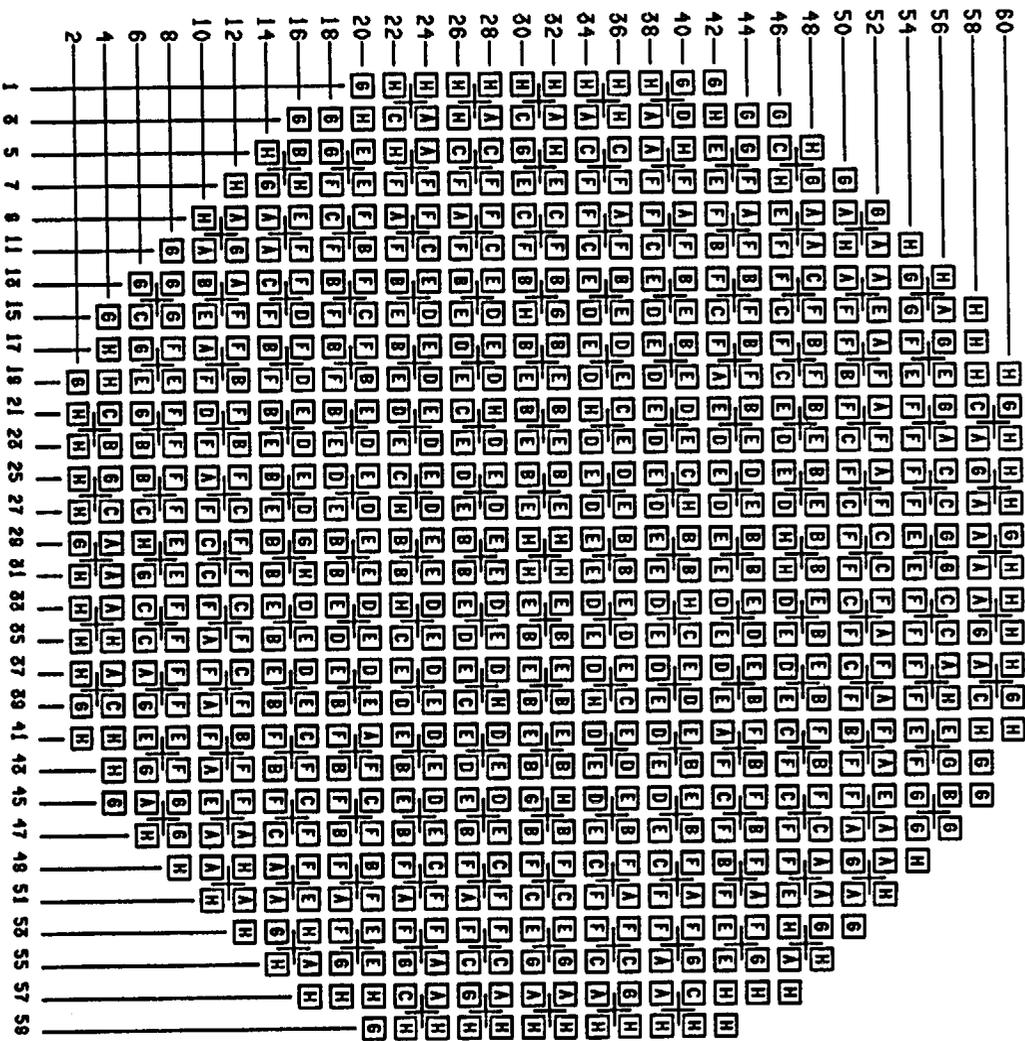
FUEL TYPE

A = 6E14-P105NAB415-1267-0-120T-150-T-3840
 B = 6E14-P105NAB416-1767-120T-150-T-3841
 C = 6E14-P105NAB416-1767-120T-150-T-3842
 D = 6E14-P105NAB415-1667-120T-150-T-3843

E = 6E12-P105SB368-146Z-120T-150-T
 F = 6E12-P105SB368-126Z-120T-150-T
 G = 6E12-P105SB389-146Z-120T-150-T
 H = 6E12-P105SB389-166Z-120T-150-T

[[GNF Proprietary Information]]
 [[enclosed by double brackets]]

Figure 2 Reference Core Loading Pattern - Cycle 10



FUEL TYPE	
A = 6E14-P10SNAB415-1267-0-120T-150-16-3959	E = 6E14-P10SNAB413-1667-120T-150-16-2580
B = 6E14-P10SNAB416-1767-120T-150-16-3960	F = 6E14-P10SNAB418-1667-120T-150-16-2581
C = 6E14-P10SNAB416-1767-120T-150-16-3961	G = 6E12-P10SSB399-1467-120T-150-16
D = 6E14-P10SNAB415-1667-120T-150-16-3962	H = 6E12-P10SSB399-1667-120T-150-16

[[GNF Proprietary Information]]
[[enclosed by double brackets]]



Global Nuclear Fuel

A Joint Venture of GE, Toshiba, & Hitachi

Affidavit

I, Glen A. Watford, state as follows:

- (1) I am Manager, Fuel Engineering Services, 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 Perry Unit 1 Cycle 10,” September 13, 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.

Affidavit

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 13th day of September, 2002.



Glen A. Watford

Global Nuclear Fuel – Americas, LLC