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Withhold from Public Disclosure Under 10 CFR 2.390
When Separated from Enclosure C, This Document can be Decontrolled

October 21, 2010
L-10-261

10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT:
Perry Nuclear Power Plant
Docket No. 50-440, License No. NPF-58
License Amendment Request to Modify Technical Specification 2.1.1, "Reactor Core SLs," to Incorporate Revised Safety Limit Minimum Critical Power Ratio Values

In accordance with the provisions of 10 CFR 50.90, FirstEnergy Nuclear Operating Company (FENOC) is submitting a request for an amendment to the Perry Nuclear Power Plant (PNPP) Technical Specifications (TS). The proposed amendment would modify TS 2.1.1, "Reactor Core SLs," by incorporating revised safety limit minimum critical power ratio (SLMCPR) values resulting from a plant-specific analysis performed for the PNPP Cycle 14 core. The analysis was performed by Global Nuclear Fuel – Americas, LLC (GNF).

An evaluation of the proposed amendment is included as Enclosure A. A non-proprietary version of the PNPP-specific analysis is included as Enclosure B. A proprietary version of the analysis is included as Enclosure C and should be withheld from public disclosure under 10 CFR 2.390. A GNF affidavit, which supports the proprietary nature of the analysis, is included as Enclosure D.

For informational purposes, the PNPP Power/Flow Operating Map is included as Enclosure E. The proposed amendment does not involve any changes to PNPP's rated thermal power or operating domains.

To support the PNPP spring 2011 refueling outage, approval of the proposed license amendment is requested by April 1, 2011. The amendment will be implemented within 60 days of approval.

A001
NRR

There are no regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - Fleet Licensing, at (330) 761-6071.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 21, 2010.

Sincerely,

Mark B. Bezilla

Enclosures:
A. Evaluation of Proposed License Amendment
B. GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR Perry Cycle 14 [Non-Proprietary]
C. GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR Perry Cycle 14 [Proprietary]
D. Global Nuclear Fuel – Americas LLC Affidavit
E. Perry Nuclear Power Plant Power/Flow Operating Map

cc: NRC Region III Administrator (without Enclosure C)
NRC Project Manager (without Enclosure C)
NRC Resident Inspector (without Enclosure C)
Executive Director, Ohio Emergency Management Agency, State of Ohio (NRC Liaison) (without Enclosure C)
Utility Radiological Safety Board (without Enclosure C)

Enclosure A
L-10-261

Evaluation of Proposed License Amendment
(Ten Pages Follow)

Subject: License Amendment Request to incorporate revised safety limit minimum critical power ratio values as a result of a site-specific fuel cycle analysis.

Attachments:

1. Proposed Technical Specification Changes (Mark Up)
2. Proposed Technical Specification Changes (Re-typed – For Information Only)

1.0 SUMMARY DESCRIPTION

This evaluation supports a FirstEnergy Nuclear Operating Company (FENOC) request to amend Operating License NPF-58 for the Perry Nuclear Power Plant (PNPP). The proposed amendment would modify Technical Specification (TS) 2.1.1, "Reactor Core SLs," by incorporating revised safety limit minimum critical power ratio (SLMCPR) values resulting from a plant-specific analysis. The revised SLMCPR values will be applicable following the PNPP Spring 2011 refueling outage.

2.0 DETAILED DESCRIPTION

The proposed change revises the SLMCPR values contained in TS 2.1.1 for two recirculation loop operation and single recirculation loop operation. The SLMCPR value for two loop operation is changing from 1.08 to 1.10; the SLMCPR value for single-loop operation is changing from 1.10 to 1.11.

A copy of TS 2.1.1 marked up with the proposed changes is provided as Attachment 1. An information-only copy of TS 2.1.1, re-typed with the proposed changes incorporated, is provided as Attachment 2. The Bases for TS 2.1.1 do not require modification to support the proposed TS changes.

3.0 TECHNICAL EVALUATION

10 CFR 50, Appendix A, General Design Criterion 10 requires that specified acceptable fuel design limits are not exceeded during any condition of normal operation including anticipated operational occurrences. To satisfy this requirement, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 4.4, "Thermal and Hydraulic Design," states that the critical power ratio (CPR) is to be established such that at least 99.9 percent of fuel rods in the core would not be expected to experience transition boiling during normal operation or anticipated operational occurrences. The Bases for PNPP TS 2.1.1 states that the SLMCPR is established such that it ensures that during normal operation and anticipated operational occurrences, at least 99.9 percent of all fuel rods in the core do not experience transition boiling.

The proposed SLMCPR values were calculated using the NRC-approved NEDE 24011-P-A-16, "General Electric Standard Application for Reactor Fuel (GESTAR II)," and the methodologies cited in a plant-specific analysis performed by Global Nuclear Fuel – Americas, LLC (GNF) for PNPP, GNF-0000-0088-8436-R1-P, "GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR Perry Cycle 14." The GNF analysis includes, but is not limited to, summaries of the methodologies, inputs, and results, used in the calculation of the proposed SLMCPR values.

The analysis resulted in a two loop operation SLMCPR value of 1.10 and a single loop operation SLMCPR value of 1.11. These values are being proposed for incorporation into the PNPP TS. The proposed values continue to satisfy the criterion that at least 99.9 percent of all fuel rods in the core do not experience transition boiling if the limit is not violated. Therefore, the requirements of 10 CFR 50, Appendix A, General Design Criterion 10 are maintained.

The PNPP core for Operating Cycle 13 was comprised of the GE14 fuel type. The Cycle 14 core will also consist of the GE14 fuel type. The differences in the SLMCPR values between the two cycles are due to changes in the two cores (for example, fuel bundle design and core loading). The difference in the delta between the two loop and single loop SLMCPR values for the two cycles is the result of the changes in the cores between the two cycles. No modifications or operational changes to systems, structures, or components (SSC) are required to support the proposed TS changes. The minimum critical power ratio operating limits are listed and controlled in accordance with the PNPP Core Operating Limits Report.

4.0 REGULATORY EVALUATION

The proposed amendment would modify PNPP TS 2.1.1, "Reactor Core Safety Limits," by incorporating revised safety limit minimum critical power ratios (SLMCPRs) following the PNPP Spring 2011 refueling outage.

4.1 Significant Hazards Consideration

FENOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below.

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed SLMCPR values will continue to ensure that during normal operation and abnormal operational transients, at least 99.9 percent of all fuel rods in the core do not experience transition boiling if the limit is not violated, thereby preserving the fuel cladding integrity. The proposed TS changes do not involve any modifications or operational changes to systems, structures, or components (SSC). The proposed TS changes do not affect any postulated accident precursors, do not affect any accident mitigating systems, and do not introduce any new accident initiation mechanisms. Therefore, the proposed TS changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed TS changes do not involve any new modes of operation, any changes to setpoints, or any plant modifications. The proposed SLMCPR values do not result in the creation of any new precursors to an accident. Therefore, the proposed TS changes do not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The proposed SLMCPR values continue to ensure that during normal operation and during anticipated operational occurrences, at least 99.9 percent of all fuel rods in the core do not experience transition boiling if the limit is not violated, thereby preserving the fuel cladding integrity. The proposed TS changes do not involve modifications or operational changes that could adversely affect the function or performance of a SSC. The proposed TS changes do not affect any postulated accident precursors, do not affect any accident mitigating systems, and do not introduce any new accident initiation mechanisms. Therefore, the proposed TS changes do not involve a significant reduction in a margin of safety.

Based on the above, FENOC concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical specifications"

10 CFR 50.36(c)(1) requires the TS to include safety limits for process variables that protect the integrity of certain physical barriers that guard against the uncontrolled release of radioactivity. The fuel cladding integrity SLMCPR is established to assure that at least 99.9 percent of the fuel rods in the core do not experience transition boiling during normal operation and abnormal operating transients. Thus, the SLMCPR is required to be contained in TS. The proposed TS changes continue to satisfy this requirement.

10 CFR 50, Appendix A, General Design Criteria (GDC) 10

GDC 10 requires that specified acceptable fuel design limits are not exceeded during any condition of normal operation including anticipated operational occurrences. To satisfy this requirement, NUREG-0800, Section 4.4, states that the critical power ratio (CPR) is to be established such that at least 99.9 percent of fuel rods in the core would not be expected to experience transition boiling during normal operation or anticipated operational occurrences. The SLMCPR is set such that the requirement is satisfied if the limit is not violated. The SLMCPR values contained in the proposed TS change maintain this limit.

4.3 <u>Precedent</u>

The NRC has approved similar SLMCPR changes, specifically:

1. Letter from M. H. Chernoff (U.S. Nuclear Regulatory Commission) to K. W. Singer (Tennessee Valley Authority), "Browns Ferry Nuclear Plant, Unit 1 - Issuance of Amendment Regarding Cycle-Specific Safety Limit Minimum Critical Power Ratio (TAC NO. MD1721) (TS-455)," February 6, 2007. (ADAMS Accession No. ML070540261)

2. Letter from J. Kim (U.S. Nuclear Regulatory Commission) to Site Vice President (Entergy Nuclear Operations, Inc.), "Pilgrim Nuclear Power Station - Issuance of Amendment RE: Technical Specification Change Concerning Safety Limit Minimum Critical Power Ratio (TAC NO. ME0241)," March 26, 2009. (ADAMS Accession No. ML090640224)

3. Letter from C. Lyon (U.S. Nuclear Regulatory Commission) to Vice President, Operations (Entergy Operations, Inc.), "Grand Gulf Nuclear Station, Unit 1 - Issuance of Amendment RE: Change to the Minimum Critical Power Ratio Safety Limit (TAC NO. ME2474)," March 25, 2010. (ADAMS Accession No. ML100680418)

4.4 <u>Conclusions</u>

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Nuclear Regulatory Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Global Nuclear Fuel – Americas, LLC, NEDE 24011-P-A-16, "General Electric Standard Application for Reactor Fuel (GESTAR II)," October 2007.

2. Global Nuclear Fuel – Americas, LLC, GNF-0000-0088-8436-R1-P, "GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR Perry Cycle 14," August 5, 2010.

Attachment 1
Proposed Technical Specification Changes (Mark Up)
(One Page Follows)

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 ≤ 23.8% RTP.

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

The Minimum Critical Power Ratio (MCPR) shall be ≥ ~~1.08~~ 1.10 for two recirculation loop operation or ≥ ~~1.10~~ 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 ≤ 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 2
Proposed Technical Specification Changes (Re-typed – For Information Only)
(One Page Follows)

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 ≤ 23.8% RTP.

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

The Minimum Critical Power Ratio (MCPR) shall be ≥ 1.10 for two recirculation loop operation or ≥ 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 ≤ 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.

Enclosure B
L-10-261

GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR Perry Cycle 14 [Non-Proprietary]
(Twenty-four Pages Follow)

8/5/2010

GNF-0000-0088-8436-R1-NP

eDRFSection: 0000-0088-8436-R1

GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR

Perry Cycle 14

Proprietary Information Notice

This document is the GNF non-proprietary version of the GNF proprietary report. From the GNF proprietary version, the information denoted as GNF proprietary (enclosed in double brackets) was deleted to generate this version.

Important Notice Regarding Contents of this Report
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Table of Contents

List of Figures

List of Tables

1.0 Methodology

GNF performs Safety Limit Minimum Critical Power Ratio (SLMCPR) calculations in accordance to NEDE-24011-P-A "General Electric Standard Application for Reactor Fuel" (Revision 16) using the following NRC-approved methodologies and uncertainties:

- NEDC-32601P-A "Methodology and Uncertainties for Safety Limit MCPR Evaluations" (August 1999).
- NEDC-32694P-A "Power Distribution Uncertainties for Safety Limit MCPR Evaluations" (August 1999).
- NEDC-32505P-A "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel" (Revision 1, July 1999).
- NEDO-10958-A "General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application" (January 1977).

Table 2 identifies the actual methodologies used for the previous cycle and the current cycle SLMCPR calculations.

2.0 Discussion

In this discussion, the TLO nomenclature is used for two recirculation loops in operation, and the SLO nomenclature is used for one recirculation loop in operation.

2.1. Major Contributors to SLMCPR Change

In general, the calculated safety limit is dominated by two key parameters: (1) flatness of the core bundle-by-bundle MCPR distribution, and (2) flatness of the bundle pin-by-pin power/R-Factor distribution. Greater flatness in either parameter yields more rods susceptible to boiling transition and thus a higher calculated SLMCPR. MIP (MCPR Importance Parameter) measures the core bundle-by-bundle MCPR distribution and RIP (R-Factor Importance Parameter) measures the bundle pin-by-pin power/R-Factor distribution. The impact of the fuel loading pattern on the calculated TLO SLMCPR using rated core power and rated core flow conditions has been correlated to the parameter MIPRIP, which combines the MIP and RIP values.

Table 3 presents the MIP and RIP parameters for the previous cycle and the current cycle along with the TLO SLMCPR estimate using the MIPRIP correlation. If the minimum core flow case is applicable, the TLO SLMCPR estimate is also provided for that case although the MIPRIP correlation is only applicable to the rated core flow case. This is done only to provide some reasonable assessment basis of the minimum core flow case trend. In addition, Table 3 presents estimated impacts on the TLO SLMCPR due to methodology deviations, penalties, and/or uncertainty deviations from approved values. Based on the MIPRIP correlation and any impacts due to deviations from approved values, a final estimated TLO SLMCPR is determined. Table 3 also provides the actual calculated Monte Carlo SLMCPRs. Given the bias and uncertainty in the MIPRIP correlation [[ ]] and the inherent variation in the Monte Carlo results [[ ]], the change in the Perry Cycle 14 calculated Monte Carlo TLO SLMCPR using rated core power and rated core flow conditions is consistent with the corresponding estimated TLO SLMCPR value.

2.2. Deviations in NRC-Approved Uncertainties

Tables 4 and 5 provide a list of NRC-approved uncertainties along with values actually used. A discussion of deviations from these NRC-approved values follows; all of which are conservative relative to NRC-approved values. Also, estimated impact on the SLMCPR is provided in Table 3 for each deviation.

2.2.1. R-Factor

At this time, GNF has generically increased the GEXL R-Factor uncertainty from [[ ]] to account for an increase in channel bow due to the emerging unforeseen phenomena called control blade shadow corrosion-induced channel bow, which is not accounted for in the channel bow uncertainty component of the approved R-Factor uncertainty. The step "σ RPEAK" in Figure 4.1 from NEDC-32601P-A, which has been provided for convenience in Figure 3 of this attachment, is affected by this deviation. Reference 4 technically justifies that a GEXL R-Factor uncertainty of [[ ]] accounts for a channel bow uncertainty of up to [[ ]].

Perry has experienced control blade shadow corrosion-induced channel bow to the extent that an increase in the NRC-approved R-Factor uncertainty [[ ]] is deemed prudent to address its impact. Accounting for the control blade shadow corrosion-induced channel bow, the Perry Cycle 14 analysis shows an expected channel bow uncertainty of [[ ]], which is bounded by a GEXL R-Factor uncertainty of [[ ]]. Thus the use of a GEXL R-Factor uncertainty of [[ ]] adequately accounts for the expected control blade shadow corrosion-induced channel bow for Perry Cycle 14.

2.2.2. Core Flow Rate and Random Effective TIP Reading

At this time, GNF has not been able to show that the NRC-approved process to calculate the SLMCPR only at the rated core power and rated core flow condition is adequately bounding relative to the SLMCPR calculated at rated core power and minimum core flow, see Reference 5. The minimum core flow condition can be more limiting due to the control rod pattern used. GNF has modified the NRC-approved process for determining the SLMCPR to include analyses at the rated core power and minimum licensed core flow point in addition to analyses at the rated core power and rated core flow point. GNF believes this modification is conservative and may in the future provide justification that the original NRC-approved process is adequately bounding.

For the TLO calculations performed at 81.0% core flow, the approved uncertainty values for the core flow rate (2.5%) and the random effective TIP reading (1.2%) are conservatively adjusted by dividing them by 81.0/100. The steps "σ CORE FLOW" and "σ TIP (INSTRUMENT)" in

Figure 4.1 from NEDC-32601P-A, which has been provided for convenience in Figure 3 of this attachment, are affected by this deviation, respectively.

Historically, these values have been construed to be somewhat dependent on the core flow conditions as demonstrated by the fact that higher values have always been used when performing SLO calculations. It is for this reason that GNF determined that it is appropriate to consider an increase in these two uncertainties when the core flow is reduced. The amount of increase is determined in a conservative way. For both parameters it is assumed that the absolute uncertainty remains the same as the flow is decreased so that the percentage uncertainty increases inversely proportional to the change in core flow. This is conservative relative to the core flow uncertainty since the variability in the absolute flow is expected to decrease somewhat as the flow decreases. For the random effective TIP uncertainty, there is no reason to believe that the percentage uncertainty should increase as the core flow decreases for TLO. Nevertheless, this uncertainty is also increased as is done in the more extreme case for SLO primarily to preserve the historical precedent established by the SLO evaluation. Note that the TLO condition is different than the SLO condition because for TLO there is no expected tilting of the core radial power shape.

The treatment of the core flow and random effective TIP reading uncertainties is based on the assumption that the signal to noise ratio deteriorates as core flow is reduced. GNF believes this is conservative and may in the future provide justification that the original uncertainties (non-flow dependent) are adequately bounding.

The core flow and random TIP reading uncertainties used in the SLO minimum core flow SLMCPR analysis remain the same as in the rated core flow SLO SLMCPR analysis because these uncertainties (which are substantially larger than used in the TLO analysis) already account for the effects of operating at reduced core flow.

2.3. Departure from NRC-Approved Methodology

No departures from NRC-approved methodologies were used in the Perry Cycle 14 SLMCPR calculations.

2.4. Fuel Axial Power Shape Penalty

At this time, GNF has determined that higher uncertainties and non-conservative biases in the GEXL correlations for the various types of axial power shapes (i.e., inlet, cosine, outlet and double hump) could potentially exist relative to the NRC-approved methodology values, see References 3, 6, 7 and 8. The following table identifies, by marking with an "X", this potential for each GNF product line currently being offered:

[[

]]

Axial bundle power shapes corresponding to the limiting SLMCPR control blade patterns are determined using the PANACEA 3D core simulator. These axial power shapes are classified in accordance to the following table:

[[

]]

If the limiting bundles in the SLMCPR calculation exhibit an axial power shape identified by this table, GNF penalizes the GEXL critical power uncertainties to conservatively account for the impact of the axial power shape. Table 6 provides a list of the GEXL critical power uncertainties determined in accordance to the NRC-approved methodology contained in NEDE-24011-P-A along with values actually used.

For the limiting bundles, the fuel axial power shapes in the SLMCPR analysis were examined to determine the presence of axial power shapes identified in the above table. These power shapes were not found; therefore, no power shape penalties were applied to the calculated Perry Cycle 14 SLMCPR values.

2.5. Methodology Restrictions

The four restrictions identified on Page 3 of NRC's Safety Evaluation relating to the General Electric Licensing Topical Reports NEDC-32601P, NEDC-32694P, and Amendment 25 to NEDE-24011-P-A (March 11, 1999) are addressed in References 1, 2, 3, and 9.

No new GNF fuel designs are being introduced in Perry Cycle 14; therefore, the NEDC-32505P-A statement "...if new fuel is introduced, GENE must confirm that the revised R-Factor method is still valid based on new test data" is not applicable.

2.6. Minimum Core Flow Condition

For Perry Cycle 14, the minimum core flow SLMCPR calculation performed at 81.0% core flow and rated core power condition was limiting as compared to the rated core flow and rated core power condition. At low core flows, the search spaces for the limiting rod pattern and the nominal rod pattern are essentially the same. Additionally, the condition that MIP [[ ]] establishes a reasonably bounding limiting rod pattern. Hence, the rod pattern used to calculate the SLMCPR at 100% rated power/81.0% rated flow reasonably assures that at least 99.9% of the fuel rods in the core would not be expected to experience boiling transition during normal operation or anticipated operational occurrences during the operation of Perry Cycle 14. Consequently, the SLMCPR value calculated from the 81.0% core flow and rated core power condition limiting MCPR distribution reasonably bounds this mode of operation for Perry Cycle 14.

2.7. Limiting Control Rod Patterns

The limiting control rod patterns used to calculate the SLMCPR reasonably assures that at least 99.9% of the fuel rods in the core would not be expected to experience boiling transition during normal operation or anticipated operational occurrences during the operation of Perry Cycle 14.

2.8. Core Monitoring System

For Perry Cycle 14, the 3DMONICORE system will be used as the core monitoring system.

2.9. Power/Flow Map

The utility has provided the current and previous cycle power/flow map in a separate attachment.

2.10. Core Loading Diagram

Figures 1 and 2 provide the core-loading diagram for the current and previous cycle respectively, which are the Reference Loading Pattern as defined by NEDE-24011-P-A. Table 1 provides a description of the core.

2.11. Figure References

Figure 3 is Figure 4.1 from NEDC-32601P-A. Figure 4 is Figure III.5-1 from NEDC-32601P-A. Figure 5 is Figure III.5-2 from NEDC-32601P-A.

2.12. Additional SLMCPR Licensing Conditions

For Perry Cycle 14, no additional SLMCPR licensing conditions are included in the analysis.

2.13. Summary

The requested changes to the Technical Specification SLMCPR values are 1.10 for TLO and 1.11 for SLO for Perry Cycle 14.

3.0 References

1. 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.

2. 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.

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

4. Letter, John F. Schardt (GNF-A) to U.S. Nuclear Regulatory Commission Document Control Desk with attention to Mel B. Fields (NRC), "Shadow Corrosion Effects on SLMCPR Channel Bow Uncertainty", FLN-2004-030, November 10, 2004.

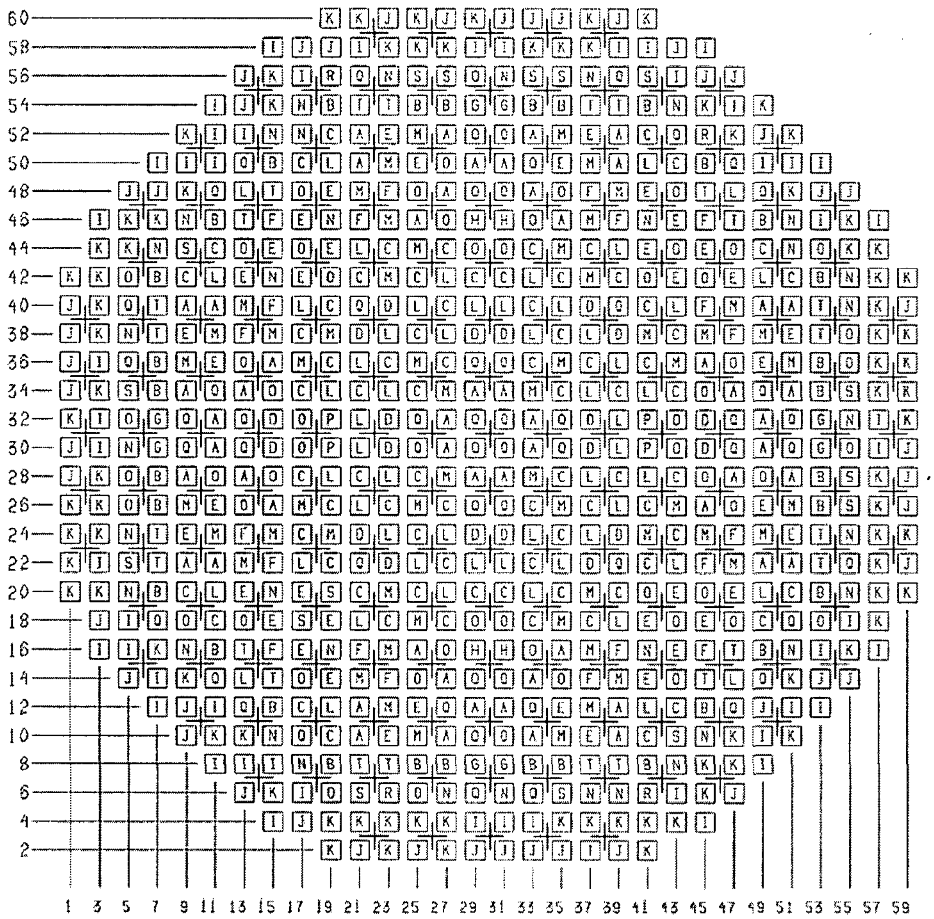
5. Letter, Jason S. Post (GENE) to U.S. Nuclear Regulatory Commission Document Control Desk with attention to Chief, Information Management Branch, et al. (NRC), "Part 21 Final Report: Non-Conservative SLMCPR", MFN 04-108, September 29, 2004.

6. Letter, Glen A. Watford (GNF-A) to U.S. Nuclear Regulatory Commission Document Control Desk with attention to Alan Wang (NRC), "NRC Technology Update – Proprietary Slides – July 31 – August 1, 2002", FLN-2002-015, October 31, 2002.

7. Letter, Jens G. Munthe Andersen (GNF-A) to U.S. Nuclear Regulatory Commission Document Control Desk with attention to Alan Wang (NRC), "GEXL Correlation for 10X10 Fuel", FLN-2003-005, May 31, 2003.

8. Letter, Andrew A. Lingenfelter (GNF-A) to U.S. Nuclear Regulatory Commission Document Control Desk with cc to MC Honcharik (NRC), "Removal of Penalty Being Applied to GE14 Critical Power Correlation for Outlet Peaked Axial Power Shapes", FLN-2007-031, September 18, 2007.

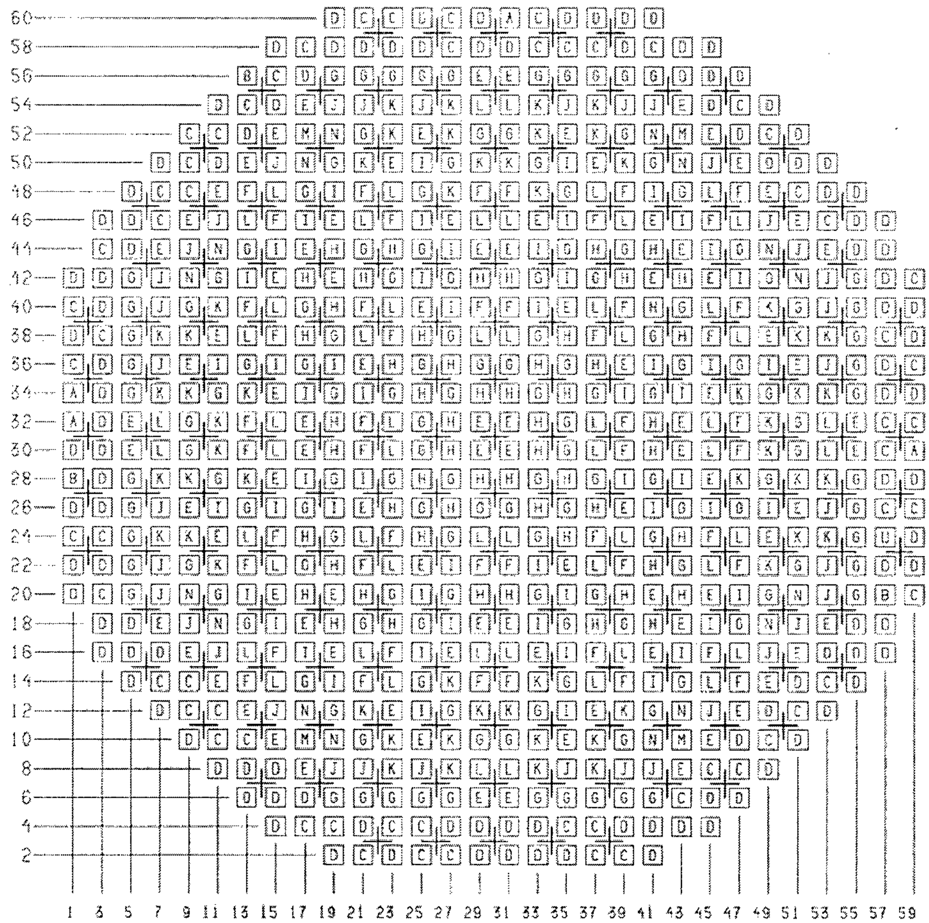
9. Letter, Andrew A. Lingenfelter (GNF-A) to U.S. Nuclear Regulatory Commission Document Control Desk with cc to MC Honcharik (NRC), "GNF2 Advantage Generic Compliance with NEDE-24011-P-A (GESTAR II), NEDC-33270P, Revision 2, June 2009 and GEXL Correlation for GNF2 Fuel, NEDC-33292P, Revision 3, June 2009", MFN 09-436, June 30, 2009.



FUEL TYPE

A = GE14-P10SNAB408-16GZ-120T-150-T6-3373
B = GE14-P10SNAB411-12G7.0/1G6.0-120T-150-T6-3371
C = GE14-P10SNAB409-15GZ-120T-150-T6-3372
D = GE14-P10SNAB404-16GZ-120T-150-T6-3370
E = GE14-P10SNAB407-16GZ-120T-150-T6-3374
F = GE14-P10SNAB407-16GZ-120T-150-T6-3374
G = GE14-P10SNAB409-15GZ-120T-150-T6-3372
H = GE14-P10SNAB404-16GZ-120T-150-T6-3370
I = GE14-P10SNAB413-15GZ-120T-150-T6-2938
J = GE14-P10SNAB405-16GZ-120T-150-T6-2939
K = GE14-P10SNAB405-16GZ-120T-150-T6-2939
L = GE14-P10SNAB404-18GZ-120T-150-T6-3113
M = GE14-P10SNAB409-17GZ-120T-150-T6-3114
N = GE14-P10SNAB413-14G7.0-120T-150-T6-3115
O = GE14-P10SNAB411-17GZ-120T-150-T6-3116
P = GE14-P10SNAB409-15GZ-120T-150-T6-3372
Q = GE14-P10SNAB404-18GZ-120T-150-T6-3113
R = GE14-P10SNAB413-14G7.0-120T-150-T6-3115
S = GE14-P10SNAB411-17GZ-120T-150-T6-3116
T = GE14-P10SNAB411-12G7.0/1G6.0-120T-150-T6-3371

Figure 1. Current Cycle Core Loading Diagram



FUEL TYPE	
A = GE14-P10SNAB413-16GZ-120T-150-T6-2580	H = GE14-P10SNAB404-18GZ-120T-150-T6-3113
B = GE14-P10SNAB413-16GZ-120T-150-T6-2581	I = GE14-P10SNAB409-17GZ-120T-150-T6-3114
C = GE14-P10SNAB413-16GZ-120T-150-T6-2810	J = GE14-P10SNAB413-14G7.0-120T-150-T6-3115
D = GE14-P10SNAB411-18GZ-120T-150-T6-2811	K = GE14-P10SNAB411-17GZ-120T-150-T6-3116
E = GE14-P10SNAB413-15GZ-120T-150-T6-2938	L = GE14-P10SNAB404-18GZ-120T-150-T6-3113
F = GE14-P10SNAB405-16GZ-120T-150-T6-2939	M = GE14-P10SNAB413-14G7.0-120T-150-T6-3115
G = GE14-P10SNAB405-16GZ-120T-150-T6-2939	N = GE14-P10SNAB411-17GZ-120T-150-T6-3116

Figure 2. Previous Cycle Core Loading Diagram

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Figure 3. Figure 4.1 from NEDC-32601P-A

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Figure 4. Figure III.5-1 from NEDC-32601P-A

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Figure 5. Figure III.5-2 from NEDC-32601P-A

Table 1. Description of Core

Description	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
Number of Bundles in the Core	748		748	
Limiting Cycle Exposure Point (i.e. BOC/MOC/EOC)	BOC	BOC	BOC (TLO) EOC (SLO)	EOC
Cycle Exposure at Limiting Point (MWd/STU)	200.0	200.0	200.0 (TLO) 13000.0 (SLO)	13000.0
% Rated Core Flow	81.0	100.0	81.0	100.0
Reload Fuel Type	GE14		GE14	
Latest Reload Batch Fraction, %	37.4		38.0	
Latest Reload Average Batch Weight % Enrichment	4.08		4.08	
Core Fuel Fraction: GE14	100.0		100.0	
Core Average Weight % Enrichment	4.09		4.08	

Table 2. SLMCPR Calculation Methodologies

Description	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
Non-power Distribution Uncertainty	NEDC-32601P-A		NEDC-32601P-A	
Power Distribution Methodology	GETAB		GETAB	
Power Distribution Uncertainty	GETAB		GETAB	
Core Monitoring System	3DMONICORE		3DMONICORE	
R-Factor Calculation Methodology	NEDC-32505P-A		NEDC-32505P-A	

Table 3. Monte Carlo Calculated SLMCPR vs. Estimate

Description	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
[[				

Table 3. Monte Carlo Calculated SLMCPR vs. Estimate

Description	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case

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Table 4. Non-Power Distribution Uncertainties

	Nominal (NRC-Approved) Value ± σ (%)	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
GETAB					
Feedwater Flow Measurement	1.76	N/A	N/A	N/A	N/A
Feedwater Temperature Measurement	0.76	N/A	N/A	N/A	N/A
Reactor Pressure Measurement	0.50	N/A	N/A	N/A	N/A
Core Inlet Temperature Measurement	0.20	N/A	N/A	N/A	N/A
Total Core Flow Measurement	6.0 SLO/2.5 TLO	N/A	N/A	N/A	N/A
Channel Flow Area Variation	3.0	N/A	N/A	N/A	N/A
Friction Factor Multiplier	10.0	N/A	N/A	N/A	N/A
Channel Friction Factor Multiplier	5.0	N/A	N/A	N/A	N/A

Table 4. Non-Power Distribution Uncertainties

	Nominal (NRC-Approved) Value ± σ (%)	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
NEDC-32601P-A					
Feedwater Flow Measurement	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Feedwater Temperature Measurement	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Reactor Pressure Measurement	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Core Inlet Temperature Measurement	0.2	0.2	0.2	0.2	0.2
Total Core Flow Measurement	6.0 SLO/2.5 TLO	6.0 SLO/3.09 TLO	6.0 SLO/2.5 TLO	6.0 SLO/3.09 TLO	6.0 SLO/2.5 TLO
Channel Flow Area Variation	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Friction Factor Multiplier	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Channel Friction Factor Multiplier	5.0	5.0	5.0	5.0	5.0

Table 5. Power Distribution Uncertainties

Description	Nominal (NRC-Approved) Value ± σ (%)	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
GETAB/NEDC-32601P-A					
GEXL R-Factor	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Random Effective TIP Reading	2.85 SLO/1.2 TLO	2.85 SLO/1.48 TLO	2.85 SLO/1.2 TLO	2.85 SLO/1.48 TLO	2.85 SLO/1.2 TLO
Systematic Effective TIP Reading	8.6	8.6	8.6	8.6	8.6
NEDC-32694P-A, 3DMONICORE					
GEXL R-Factor	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Random Effective TIP Reading	2.85 SLO/1.2 TLO	N/A	N/A	N/A	N/A
TIP Integral	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Four Bundle Power Distribution Surrounding TIP Location	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Contribution to Bundle Power Uncertainty Due to LPRM Update	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]

Table 5. Power Distribution Uncertainties

Description	Nominal (NRC-Approved) Value ± σ (%)	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case
Contribution to Bundle Power Due to Failed TIP	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Contribution to Bundle Power Due to Failed LPRM	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Total Uncertainty in Calculated Bundle Power	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]
Uncertainty of TIP Signal Nodal Uncertainty	[[ ]]	[[ ]]	[[ ]]	[[ ]]	[[ ]]

Table 6. Critical Power Uncertainties

Description	Nominal Value ± σ (%)	Previous Cycle Minimum Core Flow Limiting Case	Previous Cycle Rated Core Flow Limiting Case	Current Cycle Minimum Core Flow Limiting Case	Current Cycle Rated Core Flow Limiting Case

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Enclosure D
L-10-261

Global Nuclear Fuel - Americas LLC
Affidavit
(Three Pages Follow)

Global Nuclear Fuel - Americas LLC

AFFIDAVIT

I, Andrew A, Lingenfelter, state as follows:

(1) I am Vice President, Fuel Engineering, Global Nuclear Fuel–Americas, LLC (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 GNF proprietary report, GNF-0000-0088-8436-R1-P, *GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR, Perry Cycle 14*, Class III, (GNF Proprietary Information), dated 08/05/2010. The GNF proprietary information in GNF-0000-0088-8436-R1-P is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]] Figures and large equation objects containing GNF-A proprietary information are identified with double square brackets before and after the object. In each case, the superscript notation {3} refers to Paragraph (3) of this affidavit that provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, 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 2.390(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 GNF-A's competitors without license from GNF-A constitutes a competitive economic advantage over GNF-A and/or other companies.

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

c. Information that reveals aspects of past, present, or future GNF-A customer-funded development plans and programs, that may include potential products of GNF-A.

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 the NRC in confidence. The information is of a sort customarily held in confidence by GNF-A, 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 GNF-A, 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 GNF-A. Access to such documents within GNF-A 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 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 and/or confidentiality 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 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. 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 on this 12th day of August 2010.

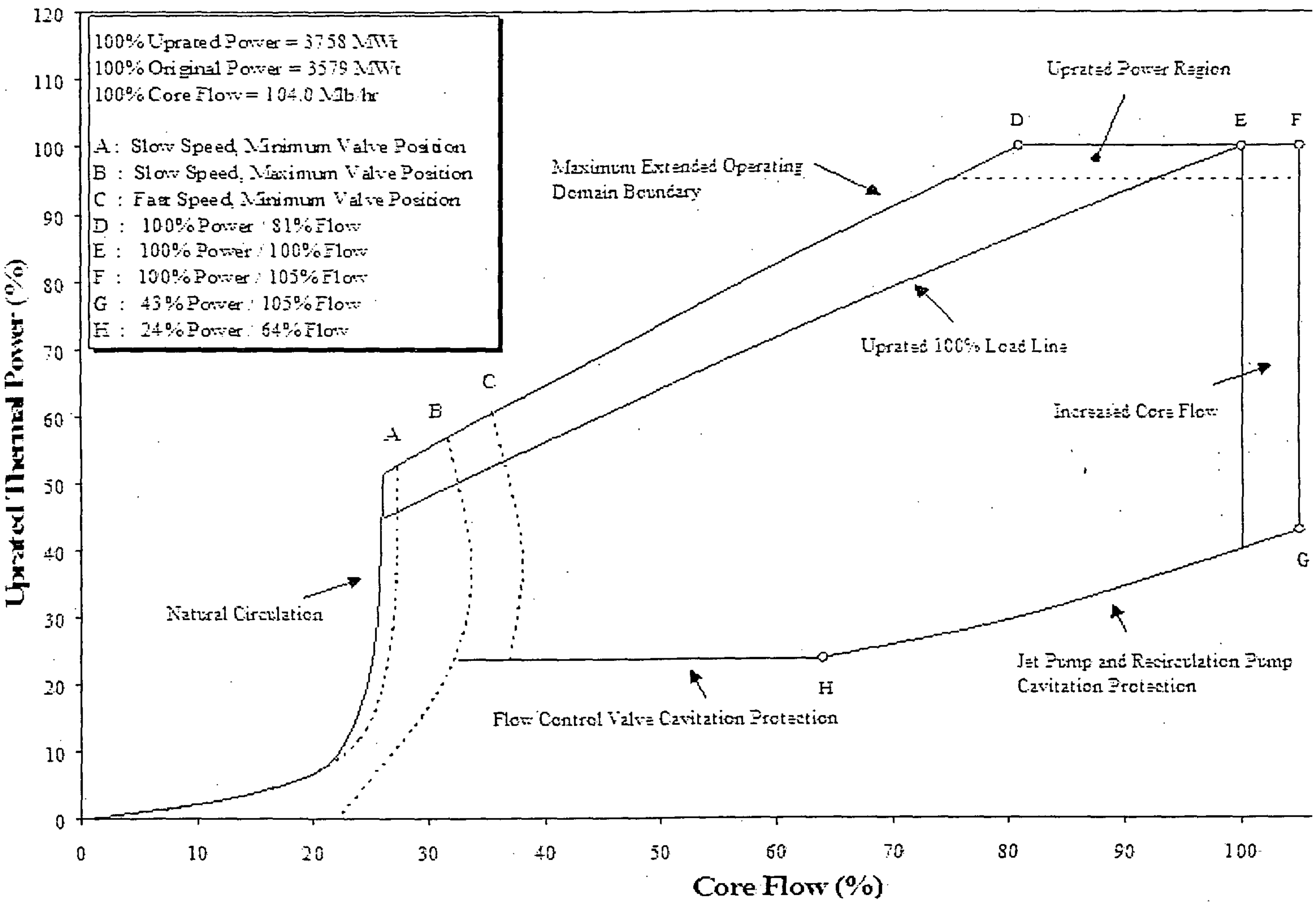
Andrew A. Lingenfelter

Andrew A. Lingenfelter
Vice President, Fuel Engineering
Global Nuclear Fuel – Americas, LLC

Enclosure E
L-10-261

Perry Nuclear Power Plant Power/Flow Operating Map
(One Page Follows)

Perry Nuclear Power Plant Power/Flow Operating Map



* This Power/Flow Map is for both Cycle 13 and 14.