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Constellation Energy Group

Nine Mile Point
Nuclear Station

November 20, 2003
NMP2L 2104

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

SUBJECT: Nine Mile Point Unit 2
Docket No. 50-410
Facility Operating License No. NPF-69

License Amendment Request: Revised Safety Limit Minimum Critical Power Ratio in Technical Specification 2.1.1.2

Gentlemen:

Pursuant to 10 CFR 50.90, Nine Mile Point Nuclear Station, LLC (NMPNS) hereby requests an amendment to Nine Mile Point Unit 2 (NMP2) Operating License NPF-69. The proposed change revises the Safety Limit Minimum Critical Power Ratio (SLMCPR) values in Technical Specification (TS) 2.1.1.2 to reflect the results of cycle-specific calculations performed for the upcoming NMP2 Operating Cycle (OC-10), using NRC-approved methodology for determining SLMCPR values. The current SLMCPR values in TS 2.1.1.2 were approved by the NRC in a safety evaluation dated March 13, 2002, for Operating Cycle 9 (OC-9) and do not provide the appropriate level of conservatism for OC-10.

NMPNS plans to use a mixed core consisting of predominantly GE11 fuel with new GE14 fuel during OC-10 whereas OC-9 uses a full core of GE11 fuel. The proposed revision to TS 2.1.1.2 takes into account the mixed core containing GE14 fuel. NMPNS requests approval of this license amendment request by March 1, 2004, with implementation prior to startup from the next refueling outage (RFO9). The loading of GE14 fuel will occur during RFO9, which is currently scheduled to begin in March 2004. This letter contains no new commitments, as reflected in Attachment 3.

Detailed information supporting the changes to the SLMCPR values is included as Attachment 4 and was provided by the NMP2 fuel vendor, Global Nuclear Fuel (GNF). Attachment 4 is considered by GNF to contain proprietary information exempt from disclosure pursuant to 10 CFR 2.790. Therefore, on behalf of GNF, NMPNS hereby makes application to withhold this document from public disclosure in accordance with 10 CFR 2.790(b)(1). An affidavit executed by GNF detailing the reasons for the request to withhold the proprietary information is included

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as Attachment 5. A non-proprietary version of the information in Attachment 4 is included as Attachment 6.

Pursuant to 10 CFR 50.91(b)(1), NMPNS has provided a copy of this license amendment request and the associated analyses regarding no significant hazards consideration to the appropriate state representative.

Very truly yours,

Peter E. Katz
Vice President Nine Mile Point

PEK/IAA/bjh

STATE OF NEW YORK :
: TO WIT:
COUNTY OF OSWEGO :

I, Peter E. Katz, being duly sworn, state that I am Vice President Nine Mile Point, and that I am duly authorized to execute and file this request on behalf of Nine Mile Point Nuclear Station, LLC. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other Nine Mile Point employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Subscribed and sworn before me, a Notary Public in and for the State of New York and County of Oswego, this 20th day of November, 2003.

WITNESS my Hand and Notarial Seal:

Notary Public Sandra A Oswald

My Commission Expires:

Date 11/20/03

SANDRA A. OSWALD
Notary Public, State of New York
No. 01OS6032276
Qualified In Oswego County
Commission Expires 10/25/05

Attachments:
1. Evaluation of Proposed Technical Specification Changes
2. Proposed Technical Specification Changes (Mark-up)
3. List of Regulatory Commitments
4. Attachment to Global Nuclear Fuel Letter No. EWG-N-03-021, dated October 3, 2003, titled "Additional Information Regarding the Cycle Specific SLMCPR for Nine Mile Point Unit 2 Cycle 10" (Proprietary)
5. Affidavit by Global Nuclear Fuel for Withholding Proprietary Information
6. Attachment to Global Nuclear Fuel Letter No. EWG-N-03-021, dated October 3, 2003, titled "Additional Information Regarding the Cycle Specific SLMCPR for Nine Mile Point Unit 2 Cycle 10" (Non-Proprietary)

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Mr. P. S. Tam, Senior Project Manager, NRR (2 copies)
Mr. J. P. Spath, NYSERDA

ATTACHMENT 1

EVALUATION OF PROPOSED TECHNICAL SPECIFICATION CHANGES

Subject: ***License Amendment Request: Revised Safety Limit Minimum Critical Power Ratio in Technical Specification 2.1.1.2***

1.0 DESCRIPTION

Section 2.1.1.2 of the Nine Mile Point Unit 2 (NMP2) Technical Specifications (TS) contains Safety Limit Minimum Critical Power Ratio (SLMCPR) values of 1.06 and 1.07 for two recirculation loop operation and single recirculation loop operation, respectively. Cycle-specific calculations performed by the NMP2 fuel vendor, Global Nuclear Fuel (GNF), for the upcoming NMP2 Operating Cycle (OC-10) have resulted in higher SLMCPR values of 1.07 and 1.09 for two recirculation loop operation and single recirculation loop operation, respectively. The cycle specific calculations considered, besides other factors, the planned use of a mixed core containing predominantly GE11 fuel with some new GE14 fuel during OC-10 whereas the current Operating Cycle (OC-9) uses a full core of GE11 fuel. The proposed change incorporates the new SLMCPR values in TS 2.1.1.2 in order to maintain the appropriate conservative margin relative to the conditions required for fuel cladding integrity.

Nine Mile Point Nuclear Station, LLC (NMPNS) requests approval of this license amendment request by March 1, 2004. This will support plans to load GE14 fuel into the core during the next refueling outage (RFO9), which is currently scheduled to begin in March 2004.

2.0 PROPOSED CHANGE

TS 2.1.1.2 currently requires that with the reactor steam dome pressure greater than or equal to 785 psig and core flow greater than or equal to 10 percent rated core flow, the minimum critical power ratio (MCPR) shall be greater than or equal to 1.06 for two recirculation loop operation, or greater than or equal to 1.07 for single recirculation loop operation. The proposed change revises these SLMCPR values to 1.07 and 1.09, respectively.

3.0 BACKGROUND

The proposed change revises the SLMCPR values in NMP2 TS 2.1.1.2 to reflect the results of a plant-specific evaluation performed by GNF for OC-10. This SLMCPR evaluation was performed using NRC approved methodology, as described in Amendment 25 to NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)," (Reference 1) and other NRC approved vendor documents, which are referenced in Attachments 4 and 6. The analysis methodology incorporates plant and cycle-specific parameters that include: 1) the expected reference loading pattern; 2) conservative variations of projected control blade patterns; 3) the actual bundle parameters; 4) the full cycle exposure range; and 5) reduced power distribution uncertainties associated with the process computer system. Table 1 of Attachments 4 and 6 provides a summary of the relevant input parameters and results of the SLMCPR value determinations for both OC-10 and OC-9 cores, including identification of differences in the two core and bundle designs and the impact of these differences on the calculated SLMCPR values.

As indicated in Table 1 of Attachments 4 and 6, the NRC approved (Reference 2) reduced power distribution uncertainties have been applied in the OC-10 analyses. These uncertainties were also included in the previous NRC approved SLMCPR evaluation for OC-9 (Reference 3) and, therefore, do not constitute a change for OC-10.

4.0 TECHNICAL ANALYSIS

The fuel cladding is one of the principal barriers to the release of radioactive materials to the environment. The SLMCPR is applied to ensure that fuel cladding integrity is not lost due to overheating during normal plant operation and anticipated transients. The SLMCPR is set such that no mechanistic fuel damage is calculated to occur if the limit is not violated. Since the parameters that result in fuel damage are not directly observable during reactor operation, the thermal and hydraulic conditions resulting in a departure from nucleate boiling have been used to mark the beginning of the region where fuel damage could occur. Although it is recognized that a departure from nucleate boiling would not necessarily result in damage to BWR fuel rods, the critical power at which boiling transition is calculated to occur has been adopted as a convenient limit. However, the uncertainties in monitoring the core operating state and in the procedures used to calculate the critical power result in an uncertainty in the value of the critical power. Therefore, the SLMCPR is defined as the critical power ratio in the limiting fuel assembly for which more than 99.9 percent of the fuel rods in the core are expected to avoid boiling transition considering the power distribution within the core and all uncertainties.

The GNF evaluation for the OC-10 mixed core design has concluded that the calculated SLMCPR values of 1.07 for two recirculation loop operation and 1.09 for single recirculation loop operation are appropriate when the approved methodology and the reduced uncertainties given in General Electric Topical Reports NEDC-32601P-A and NEDC-32694P-A are used. The limiting SLMCPR values for both two loop and single loop operation occur at the end of cycle (EOC). The calculated values, rounded to two digits, are shown in Table 2 of Attachments 4 and 6, and include a penalty for top-peaked power shape in GE14 fuel bundles. Factors contributing to the increase in the SLMCPR values from their current TS values are discussed in Attachments 4 and 6.

NRC generic questions pertaining to how GE14 applications satisfy the conditions of the NRC's safety evaluation (Reference 2) regarding NEDC-32601P-A and NEDC-32694P-A have been addressed in Reference 4. Other generically applicable questions relating to applications of the GEXL14 correlation and the applicable range for the R-factor methodology are addressed in Reference 5. The NMP2 specific core loading information for OC-10 and OC-9 is provided in Figures 1 and 2, respectively, of Attachments 4 and 6. The MCPR Importance Parameter (MIP) and R Factor Importance Parameter (RIP) values for NMP2 OC-9 and OC-10 are provided in Table 1 of Attachment 4.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

The proposed change revises the Safety Limit Minimum Critical Power Ratio (SLMCPR) values stated in Nine Mile Point Unit 2 (NMP2) Technical Specification (TS) 2.1.1.2. This revision reflects the results of cycle-specific calculations performed by the fuel vendor, Global Nuclear Fuel, for the next NMP2 Operating Cycle (OC-10), using NRC-

approved methodology for determining SLMCPR values. The revision will maintain the appropriate conservative margin in TS 2.1.1.2 for OC-10.

Nine Mile Point Nuclear Station, LLC (NMPNS) has evaluated whether or not a significant hazards consideration is involved with the proposed change by focusing on the three standards set forth in 10 CFR 50.92 , "Issuance of amendment," as discussed below.

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

   Response: No.

   The revision to the Safety Limit Minimum Critical Power Ratio (SLMCPR) values stated in TS 2.1.1.2 has been performed for OC-10 using NRC-approved methods and uncertainties. The analysis methodology incorporates appropriate cycle-specific parameters and reduced power distribution uncertainties in determining the revised SLMCPR values. The analyses do not change the method of operating the plant and have no effect on the probability of an accident initiating event or transient.

   The SLMCPR ensures that no mechanistic fuel damage occurs in the core if the limit is not violated. The revised SLMCPR values maintain the appropriate conservative margin to transition boiling and the probability of fuel damage is not increased.

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

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

   Response: No.

   The revised SLMCPR values for the OC-10 core reload have been calculated in accordance with NRC approved methods and uncertainties. The changes do not involve any new method for operating the facility and do not involve any facility modifications. No new initiating events or transients result from these changes.

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

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

   Response: No.

The proposed change does not reduce a margin of safety as defined in the TS bases. The increased cycle-specific SLMCPR values are calculated using NRC-approved methods and uncertainties, which are in accordance with the current fuel design and licensing criteria. These increased values are high enough to ensure that greater than 99.9 percent of all fuel rods in the core are expected to avoid transition boiling if the limits are not violated, thereby maintaining the fuel cladding integrity during normal plant operation and anticipated transients.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, NMPNS concludes that the proposed amendment involves no 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.

5.2 Applicable Regulatory Requirements/Criteria

The proposed Operating Cycle 10 SLMCPR values will continue to ensure that 99.9 percent of the fuel rods in the core do not experience boiling transition during any condition of normal operation, including the effects of anticipated operational occurrences. Therefore, the requirements of GDC 10, "Reactor Design," regarding acceptable fuel design limits will continue to be met.

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 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.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed revision to the SLMCPR values stated in TS 2.1.1.2 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 effluent 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.

7.0 REFERENCES

1. Amendment 25 to NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)," dated December 13, 1996

2. 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), dated March 11, 1999

3. Amendment 105 to NMP2 Facility Operating License No. NPF-69, dated March 13, 2002

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), "Final Presentation Material for GEXL Presentation – February 11, 2002," FLN-2002-004, February 12, 2002

ATTACHMENT 2

Proposed Technical Specification Changes (Mark-up)

The current version of Technical Specifications page 2.0-1 has been marked-up by hand to reflect the proposed change.

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 ≤ 25% RTP.

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

MCPR shall be ≥ 1.06 (1.07) for two recirculation loop operation or ≥ 1.07 (1.09) 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 3

List of Regulatory Commitments

The following table identifies those actions committed to by Nine Mile Point Nuclear Station, LLC (NMPNS) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

REGULATORY COMMITMENT	DUE DATE
None	N/A

ATTACHMENT 5

Affidavit by Global Nuclear Fuel for Withholding Proprietary Information

Affidavit

I, Margaret E. Harding, 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 Nine Mile Point Unit 2 Cycle 10," October 2, 2003. GNF proprietary information is indicated by enclosing it in double brackets. In each case, the superscript notation [3] refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, 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) To address the 10 CFR 2.790 (b) (4), the information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by 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 3rd day of October, 2003.

Margaret E. Harding
Global Nuclear Fuel – Americas, LLC

ATTACHMENT 6

Attachment to Global Nuclear Fuel Letter No. EWG-N-03-021, dated October 3, 2003, titled "Additional Information Regarding the Cycle Specific SLMCPR for Nine Mile Point Unit 2 Cycle 10" (Non-Proprietary)

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 Nine Mile Point Unit 2 Cycle 10 SLMCPR Value

Table 1 summarizes the relevant input parameters and results of the safety limit MCPR (SLMCPR) determination for the Nine Mile Point Unit 2 Cycle 10 and Cycle 9 cores. The SLMCPR evaluations were performed using NRC approved methods and uncertainties [1].

In comparing the Nine Mile Point Unit 2 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.

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The uncontrolled bundle pin-by-pin power distributions were compared between the Nine Mile Point Unit 2 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 Nine Mile Point Unit 2 Cycle 10 limiting case analyzed at EOC, [[

]] the Nine Mile Point Unit 2 Cycle 10 bundles are more peaked than the bundles used for the Cycle 9 SLMCPR analysis.

As indicated in Table 1, the NRC-approved [1] reduced power distribution uncertainties have been applied for the Nine Mile Point Unit 2 Cycle 10 analyses. These reduced power distribution uncertainties were also included in the previous SLMCPR calculation for Nine Mile Point Unit 2 Cycle 9 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 [[

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These calculations use the GEXL14 correlation for GE14 fuel. The SLMCPR penalty associated with a top-peaked power shaped in GE14 bundles has been incorporated directly into the calculated value by applying the higher GEXL14 uncertainty and bias indicated on sheet 35 of the presentation materials attached to Reference [6]. The details of the evaluation are provided in Table 2. A SLMCPR penalty of 0.016 is included in the value at EOC; becoming the limiting SLMCPR for this cycle. Top-peaked power shapes were present only at EOC. The potential impact of a bias on the calculated SLMCPR due to a double-humped axial power shape was considered. For this plant and cycle, no double-humped power shapes were present. The DLO and SLO SLMCPR values calculated for Cycle 10 of Nine Mile Point 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.

Summary

[[ ]] have been used to compare quantities that impact the calculated SLMCPR value. Based on these comparisons, the conclusion is reached that the Nine Mile Point Unit 2 Cycle 10 core/cycle has a more peaked core MCPR distribution [[ ]] than what was used to perform the Cycle 9 SLMCPR evaluation; and the Nine Mile Point Unit 2 Cycle 10 core/cycle has a more peaked in-bundle power distributions [[ ]] than what was used to perform the Cycle 9 SLMCPR evaluation. Both of these characteristics help to mitigate [[ ]] so that a net increase of 0.01 from Cycle 9 is realized. The potential impact of a bias on the calculated SLMCPR due to a double-humped axial power shape was considered. For this plant and cycle, no double-humped power shapes were present.

The calculated 1.07 Monte Carlo SLMCPR for Nine Mile Point Unit 2 Cycle 10 is consistent with what one would expect [[

]] the 1.07 SLMCPR value is appropriate when the approved methodology and the reduced uncertainties given in NEDC-32601P-A and NEDC-32694P-A are used.

Based on all of the facts, observations and arguments presented above, it is concluded that the calculated SLMCPR value of 1.07 for the Nine Mile Point Unit 2 Cycle 10 core is appropriate.

For single loop operations (SLO) the calculated safety limit MCPR for the limiting case is 1.09 as determined by specific calculations for Nine Mile Point Unit 2 Cycle 10. The limiting value for SLO occurs at EOC.

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 Nine Mile Point Unit 2 Cycle 10 is provided in Figure 1. For comparison the core loading information for Nine Mile Point Unit 2 Cycle 9 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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The SLO value at EOC includes a penalty for top-peaked power shape and remains at 1.09 when rounded to two-digits as seen in Table 2. It is typical to see an SLO value that is 0.01 to 0.02 higher than the DLO value.

Prepared by:

R. M. Butrovich
Technical Program Manager
Global Nuclear Fuel – Americas

Verified by:

J. E. Fawks
Technical Program Manager
Global Nuclear Fuel – Americas

Table 1

Comparison of the Nine Mile Point Unit 2 Cycle 10 and Cycle 9 SLMCPR

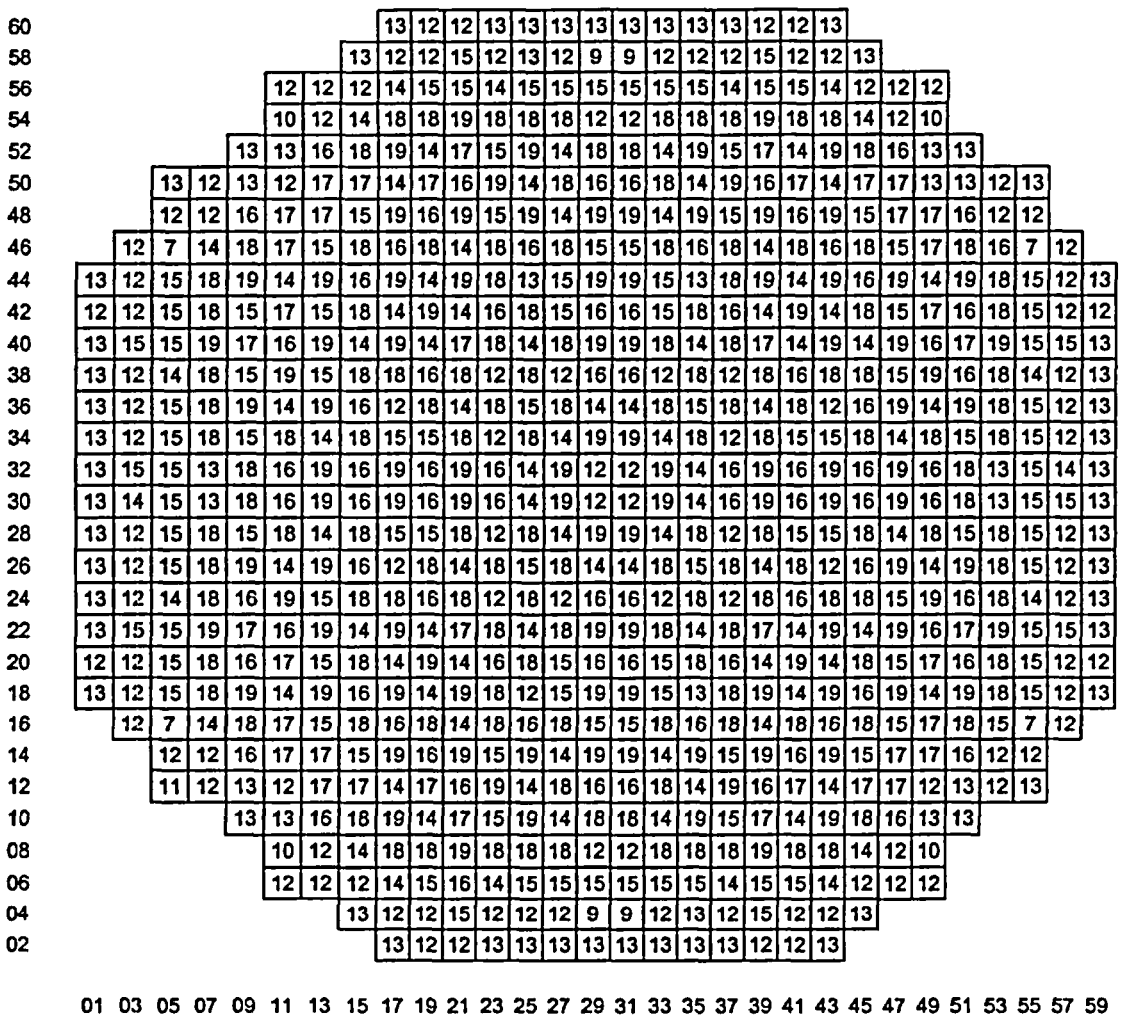
QUANTITY, DESCRIPTION	Nine Mile Point Unit 2 Cycle 9	Nine Mile Point Unit 2 Cycle 10
Number of Bundles in Core	764	764
Limiting Cycle Exposure Point	PHE	EOC
Cycle Exposure at Limiting Point [MWd/ST]	10,000	14,000 (EOC-1325)
Reload Fuel Type	GE11	GE14
Latest Reload Batch Fraction [%]	37.2	37.2
Latest Reload Average Batch Weight % Enrichment	4.06	4.04
Batch Fraction for GE14 [%]	0.0	37.2
Batch Fraction for GE11 [%]	100.0	62.8
Core Average Weight % Enrichment	4.09	4.05
Core MCPR (for limiting rod pattern)	1.27	1.40
[[		]]
[[		]]
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)	**1.06**	**1.07**
Calculated Safety Limit MCPR (SLO)	**1.07**	**1.09**

Table 2

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

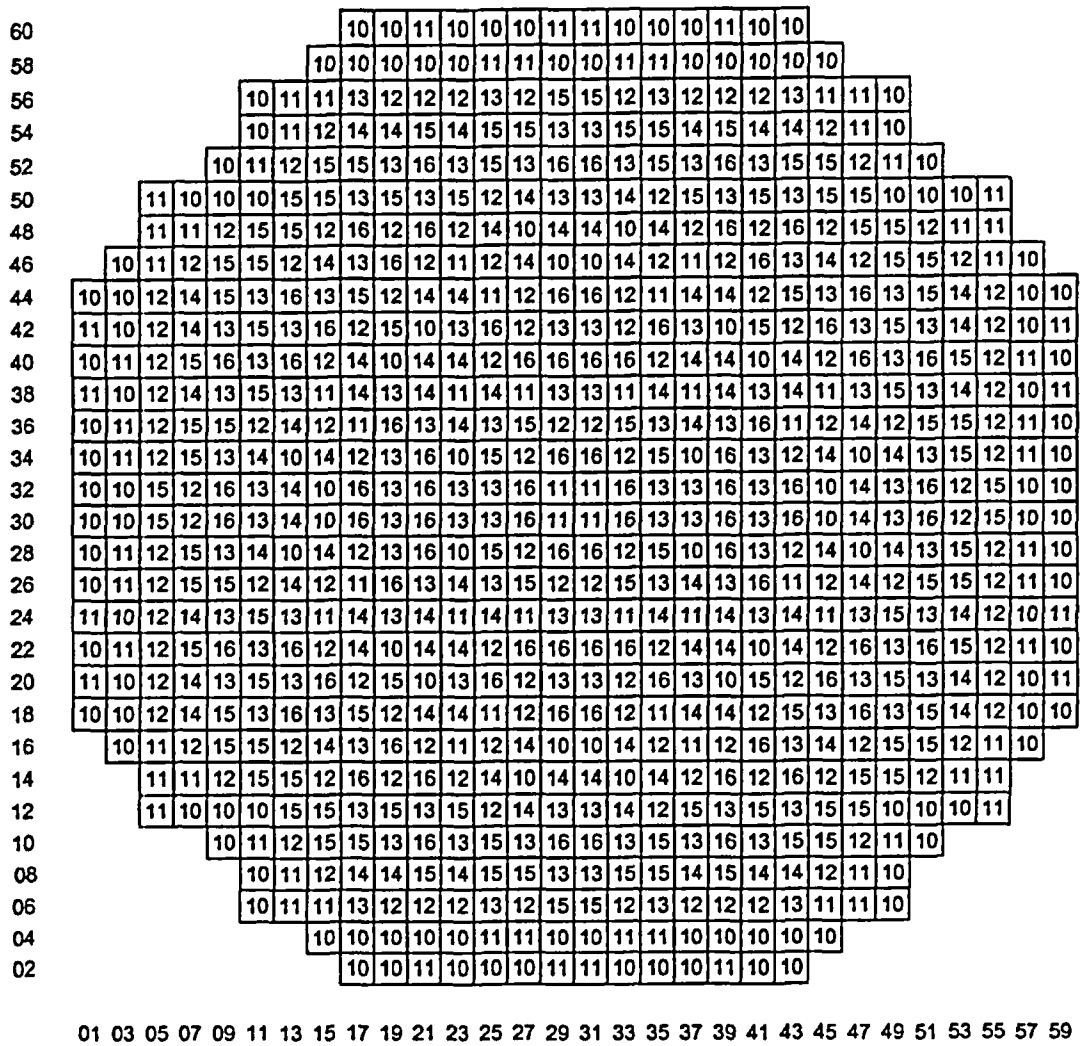
	Dual Loop Ops.			Single Loop Ops.	
	BOC	PHE	EOC	BOC	EOC
Calculated M/C SLMCPR	1.0699	1.0541	1.0552	1.0855	1.0707
Penalty for top-peaked power shape	0.000	0.000	0.0163	0.000	0.0156
Credit for Reduced Uncertainties	0.000	0.000	0.000	0.000	0.000
Was power shape outlet peaked?	N	N	Y	N	Y
Adjusted SLMCPR without rounding	1.0699	1.0541	1.0715	1.0855	1.0863
SLMCPR for Tech Spec Submittal	**DLO 1.07**			**SLO 1.09**	

Figure 1 Reference Core Loading Pattern – Cycle 10



IAT	Bundle Name	No.	Cycle Loaded
7	GE11-P9CUB349-10GZ1-120M-146-T	4	5
9	GE11-P9CUB375-12GZ-120T-146-T	4	6
10	GE11-P9CUB413-12GZ-120T-146-T	4	7
11	GE11-P9CUB414-13GZ-120T-146-T	1	7
12	GE11-P9CUB407-14GZ-120T-146-T-2382	110	8
13	GE11-P9CUB407-14GZ-120T-146-T-2383	73	8
14	GE11-P9CUB404-12GZ-120T-146-T-2501	96	9
15	GE11-P9CUB407-14GZ-120T-146-T-2502	108	9
16	GE11-P9CUB407-14GZ-120T-146-T-2503	80	9
17	GE14-P10CNAB406-15GZ-120T-150-T-2674	40	10
18	GE14-P10CNAB404-15GZ-120T-150-T-2675	140	10
19	GE14-P10CNAB403-17GZ-120T-150-T-2676	104	10

Figure 2 Reference Core Loading Pattern – Cycle 9



IAT	Bundle Name	No.	Cycle Loaded
10	GE11-P9CUB413-12GZ-120T-146-T	136	7
11	GE11-P9CUB414-13GZ-120T-146-T	96	7
12	GE11-P9CUB407-14GZ-120T-146-T-2382	132	8
13	GE11-P9CUB407-14GZ-120T-146-T-2383	116	8
14	GE11-P9CUB404-12GZ-120T-146-T-2501	96	9
15	GE11-P9CUB407-14GZ-120T-146-T-2502	108	9
16	GE11-P9CUB407-14GZ-120T-146-T-2503	80	9