Charles R. Pierce
Regulatory Affairs Director

Southern Nuclear Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

Tel 205.992.7872
Fax 205.992.7601

Enclosure 9 contains Proprietary Information not for Public disclosure. Withhold per 10 CFR 2.390

SOUTHERN COMPANY

September 17, 2014

Docket Nos.: 50-348 50-424
50-364 50-425

NL-14-0115

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

Joseph M. Farley Nuclear Plant – Units 1 and 2
Vogtle Electric Generating Plant – Units 1 and 2
License Amendment Request to Revise Technical Specification
Surveillance Requirement 3.1.3.2 and Specification 5.6.5

Ladies and Gentlemen:

Pursuant to 10 CFR 50.90, Southern Nuclear Operating Company (SNC) hereby requests an amendment to Facility Operating License Nos. NPF-2 and NPF-8 for the Joseph M. Farley Nuclear Plant Units 1 and 2 (FNP) and NPF-68 and to NPF-81 for the Vogtle Electric Generating Plant Units 1 and 2 (VEGP). This amendment request proposes to revise Technical Specification (TS) Surveillance Requirement (SR) 3.1.3.2 and Specification 5.6.5.

The following Note is proposed to be added to SR 3.1.3.2:

> "SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR."

The following reference will be added to Specification 5.6.5, "Core Operating Limits Report (COLR)":

> "WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997."

Appropriate Bases changes would also be made consistent with the TS changes discussed above.

Enclosure 1 provides the basis for the proposed change to the FNP and VEGP TS. Enclosure 2 provides the FNP TS and Bases markup pages showing the proposed changes. Enclosure 3 provides the FNP TS clean typed pages showing the proposed

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NRR

Enclosure 9 to this letter contains Proprietary Information that should be withheld from public disclosure per 10 CFR 2.390. When separated from Enclosure 9 there are no withholding criteria.

changes. Enclosure 4 provides the VEGP TS and Bases markup pages showing the proposed changes. Enclosure 5 provides the VEGP TS clean typed pages showing the proposed changes. Typical revised pages from a Core Operating Limits Report are provided in Enclosures 6 and 7 for FNP and VEGP, respectively, and are provided for information only.

By letter dated July 25, 2012, FirstEnergy Nuclear Operating Company (FENOC) submitted a similar amendment request for the Beaver Valley Power Station (BVPS). By letter dated December 28, 2012, the NRC issued a request for additional information (RAI) with three questions. Based on later correspondence between FENOC and the NRC, the NRC staff stated that a response to the third RAI question is not required. Enclosure 9 provides the proprietary SNC response to the first and second question of NRC RAI to BVPS. Enclosure 10 provides the non-proprietary SNC response to the first and second question of NRC RAI to BVPS. Enclosure 8 provides the Westinghouse affidavit requesting to withhold Enclosure 9 from public disclosure.

Due to the upcoming VEGP Unit 1 performance of SR 3.1.3.2 currently projected for June 2015, SNC requests approval of the proposed license amendment by May 15, 2015. The proposed changes would be implemented within 90 days of issuance of the amendments for FNP and VEGP.

In accordance with 10 CFR 50.91(b)(1), "State Consultation," a copy of this application and its reasoned analysis about no significant hazards considerations is being provided to the designated Alabama and Georgia officials.

This letter contains no NRC commitments. If you have any questions, please contact Ken McElroy at (205) 992-7369.

Mr. C. R. Pierce states he is Regulatory Affairs Director of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

C. R. Pierce

C. R. Pierce
Regulatory Affairs Director

Sworn to and subscribed before me this 17 *day of* September, *2014.*

Laura L. Crumpton
Notary Public

My commission expires: 10/8/2017

CRP/RMJ/lac

Enclosures:
1. FNP and VEGP Basis for Proposed Change
2. FNP Technical Specifications and Bases Markup Pages
3. FNP Technical Specifications Clean Typed Pages
4. VEGP Technical Specifications and Bases Markup Pages
5. VEGP Technical Specifications Clean Typed Pages
6. FNP Representative COLR Markups (for Information Only)
7. VEGP Representative COLR Markups (for Information Only)
8. Westinghouse Affidavit Requesting Withholding of Enclosure 9
9. SNC Response to BVPS RAI Questions (Proprietary)
10. SNC Response to BVPS RAI Questions (Non-Proprietary)

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Executive Vice President & Chief Nuclear Officer
Mr. D. R. Madison, Vice President – Vogtle
Ms. C. A. Gayheart, Vice President – Farley
Mr. B. L. Ivey, Vice President – Regulatory Affairs
Mr. T. E. Tynan, Vice President – Fleet Operations
RType: CFA04.054; CVC7000

U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Vogtle
Mr. L. M. Cain, Senior Resident Inspector – Vogtle
Mr. S. A. Williams, NRR Project Manager - Farley
Mr. P. K. Niebaum, Senior Resident Inspector – Farley

Alabama Department of Public Health
Dr. D. E. Williamson, State Health Officer

State of Georgia
Mr. J. H. Turner, Environmental Director Protection Division

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Enclosure 1

FNP and VEGP Basis for Proposed Change

1.0 Summary Description

The proposed changes revise the near-end of life (EOL) Moderator Temperature Coefficient (MTC) Surveillance Requirement (SR) 3.1.3.2 for the Joseph M. Farley Nuclear Plant Units 1 and 2 (FNP) and the Vogtle Electric Generating Plant Units 1 and 2 (VEGP) by placing a set of conditions on reactor core operation, which if met, would allow exemption from the required MTC measurement. The conditional exemption will be determined on a cycle-specific basis by considering the margin predicted to the Surveillance Requirement MTC limit and by the performance of other reactor core parameters, such as beginning of life (BOL) MTC measurements and the critical boron concentration as a function of cycle length.

Appropriate Bases changes would also be made consistent with the TS changes discussed above.

2.0 Proposed Changes

The following Note is proposed to be added to SR 3.1.3.2:

> "SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR."

The following reference will be added to Specification 5.6.5, "Core Operating Limits Report (COLR)":

> "WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997."

3.0 Background

One of the controlling parameters for power and reactivity increases is the MTC. The requirements of Technical Specification (TS) 3.1.3 ensure that the MTC remains within the bounds used in the applicable Updated Final Safety Analysis Report (UFSAR) accident analysis (Chapter 15). This, in turn, ensures inherently stable power operations during normal operation and accident conditions.

The TS place limits on the MTC, based on the accident analysis assumptions for the moderator density coefficient (MDC). A positive MDC corresponds to a negative MTC. The most negative MTC Limiting Condition for Operation (LCO) limit requires that the MTC be less negative than the specified limit for the all rods withdrawn, EOL, Rated Thermal Power condition. To demonstrate compliance with the most negative MTC LCO, the Surveillance requires verification of the MTC after a 300 ppm equilibrium boron concentration is reached. Because the Hot Full Power (HFP) MTC value will gradually become more negative with additional core burnup and reduction in boron concentration, a 300 ppm MTC Surveillance value should be less negative than the EOL LCO limit. To account for this effect, the 300 ppm MTC Surveillance value is sufficiently less negative

than the EOL LCO limit value, to provide assurance that the LCO limit will be met as long as the 300 ppm MTC Surveillance criterion is met.

Currently, the Technical Specifications require measurements of MTC at BOL to verify the most positive MTC limit is satisfied and near-EOL to verify the most negative MTC limit is satisfied. At BOL, the measurement of the isothermal temperature coefficient is relatively simple to perform since it is done at hot zero power isothermal conditions and is not complicated by changes in the enthalpy rise or the presence of xenon. The measurement made near-EOL is performed at or near HFP conditions. MTC measurements at HFP are more difficult to perform due to small variations in soluble boron concentration, changes in xenon concentration and distribution, changes in fuel temperature, and changes in enthalpy rise created by small changes in the core average power during the measurement. Changes in each of these parameters must be accurately accounted for when reducing the measurement data, or additional measurement uncertainties will be introduced. Even though these additional uncertainties may be small, the total reactivity change associated with the swing in moderator temperature is also relatively small. The resulting MTC measurement uncertainty created by even a small change in power level can then become significant and, if improperly accounted for, can yield misleading measurement results.

The MTC measurement typically includes time at reduced power as a result of the measurement procedures. This measurement introduces a perturbation to normal reactor operation and increases the potential for a human performance error involving a reactivity manipulation. An alternate method is proposed to improve availability and minimize perturbations on normal reactor operation. The MTC measurement is replaced by a design calculation of the core MTC if predefined requirements are met.

The proposed change would modify the EOL MTC Surveillance Requirement by placing a set of conditions on core operations. If these conditions are met, i.e., the specified revised prediction of the MTC and several core parameters measured during the cycle are within specified bounds, the Surveillance measurement would not be required to be performed.

4.0 Technical Evaluation

The conditional exemption from the Hot Full Power (HFP) near-EOL 300 ppm MTC measurement does not impact the safe operation of the FNP and VEGP. The safety analysis assumption of a constant MDC and the actual value assumed will not change. The Bases for and values of the most negative MTC LCO and Surveillance Requirement are not changed. Instead, a revised prediction is compared to the MTC Surveillance limit to determine if the limit is met. The procedure for calculating the revised prediction is consistent with the approved algorithm contained in WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," (Reference 1).

The proposed change was submitted to the NRC in Westinghouse topical report WCAP-13749-P in June 1993. In October 1996, the NRC determined the report to be acceptable for referencing in license applications to the extent specified and under the limitations stated in the Brookhaven Technical Evaluation Report (TER) and the NRC staff's Safety Evaluation Report.

The NRC approved WCAP-13749-P with two conditions:

> "(1) only PHOENIX/ANC calculation methods are used for the individual plant analyses relevant to determinations for the EOL MTC plant methodology, and (2) the predictive correction is reexamined if changes in core fuel designs or continued MTC calculation/measurement data show significant effect on the predictive correction."

The FNP and VEGP resolution to both of these conditions is discussed below.

Condition 1

Only PHOENIX/ANC calculation methods are used for the individual plant analyses relevant to determinations for the EOL MTC plant methodology.

SNC Disposition to Condition 1

The FNP and VEGP core design calculations are currently being transitioned from nuclear calculations that are performed with the PHOENIX-P lattice code to generate cross-section data to those that will be performed with the PARAGON lattice code.

In Section 4.0, Conditions and Limitations of the NRC's Safety Evaluation (SE) for WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," (Reference 2), the NRC stated:

> "1. The PARAGON code can be used as a replacement for the PHOENIX-P lattice code, whenever the PHOENIX-P code is used in NRC approved methodologies."

The NEXUS methodology is a re-parameterization of the PARAGON nuclear data output and a new reconstruction approach within the ANC core simulator code to simplify the use of this code system for design use. NEXUS has been implemented in the PARAGON/ANC code system for design use. Specifically, the NEXUS methodology has been implemented in the parameterization of PARAGON cross sections for input to ANC and also in ANC to reconstruct those cross sections at specific nodal conditions. The NEXUS methodology provides a linkage between PARAGON and ANC, establishing a new code system, while still using PARAGON.

In Section 5.0, Conclusion, of the NRC's SE for WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," (Reference 3), the NRC stated:

> "The NRC staff has reviewed the TR submitted by Westinghouse and determined that the NEXUS/ANC code system is adequate to replace the PARAGON/ANC code system wherever the latter is used in NRC-approved methodologies."

As discussed above, future core design calculations that are performed using the PARAGON/ANC or NEXUS/ANC system will be equivalent to those performed with those using the PHOENIX/ANC system. The use of PARAGON is consistent with condition (1) above in the NRC SER for WCAP-13749-P, since it was benchmarked

against PHOENIX-P. Similarly, the use of NEXUS is consistent with condition (1) above in the SER for WCAP-13749-P, since it was benchmarked against PARAGON (which was benchmarked against PHOENIX-P). Therefore the PARAGON and NEXUS codes satisfy the TER requirement to demonstrate the uncertainty limits assumed in WCAP-13749-P-A, as discussed on page 5 of the TER. The NRC used this TER as the basis for their SER.

For additional information regarding how SNC will meet this Condition, see Enclosure 9 (proprietary) or Enclosure 10 (non-proprietary).

Condition 2

The predictive correction is reexamined if changes in core fuel designs or continued MTC calculation/measurement data show significant effect on the predictive correction.

SNC Disposition to Condition 2

Prior to the use of the conditional elimination technique, SNC will confirm that core design changes and MTC calculation and measurement data do not show a significant effect on the predictive correction. If a significant effect is found, the use of the predictive correction will be re-examined.

All of the core performance benchmark criteria confirmed from startup physics test results, from routine HFP boron concentration measurements, and from flux map Surveillances performed during the cycle must be met before the Revised Predicted MTC can be calculated in accordance with the prescribed algorithm contained in Reference 1. An illustration of the benchmark criteria is contained in Table D-1, "Benchmark Criteria for Application of the 300 PPM MTC Conditional Exemption Methodology," in WCAP-13749-P-A.

For additional information regarding how SNC will meet this Condition, see Enclosure 9 (proprietary) or Enclosure 10 (non-proprietary).

SNC is using the NRC-approved WCAP-13749-P-A as the basis for this License Amendment Request. SNC will meet all of the technical requirements in the approved WCAP, but proposes an enhancement to reduce regulatory burden for both the NRC and the licensee. SNC proposes not to submit a "Most Negative Moderator Temperature Coefficient Limit Report" to the NRC, for two reasons. First, there is an inconsistency in WCAP-13749-P-A regarding the time frame of data collection and the submittal of the Most Negative Moderator Temperature Coefficient Limit Report to the NRC. Additionally, the Most Negative Moderator Temperature Coefficient Limit Report serves no apparent technical purpose. Each of these reasons is discussed below.

Section 3.3.3 of WCAP-13749-P-A states:

"The Technical Specification Bases of the most negative MTC LCO and SR and the values of these limits are not altered. Instead, a revised prediction is compared to the SR MTC to determine if the SR limit is met. The revised prediction is simply the sum of the predicted HFP 300 ppm SR MTC plus an AFD correction factor plus a predictive correction term. This algorithm is summarized in Table 3-3."

Appendix A of WCAP-13749-P-A requires a new Specification 6.9.1.7 to be added as stated below.

> "6.9.1.7 The most negative MTC limits shall be provided to the NRC Regional Administrator with a copy to the Director of Nuclear Reactor Regulation, Attention: Chief, Core Performance Branch, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, at least 60 days prior to the date the limit would become effective unless otherwise approved by the Commission by letter. This report will include the data required for the determination of the Revised Prediction of the 300 ppm/ARO/RTP MTC per WCAP-13749, "Safety Evaluation Supporting the Conditional Elimination of the Most Negative EOL Moderator Temperature Coefficient Measurement", May, 1993 (Westinghouse Proprietary)."

Since the Most Negative Moderator Temperature Coefficient Limit Report would have to be submitted at least 60 days before reaching 300 ppm boron concentration, it cannot include the 300 ppm data required for determining the Revised Prediction. To satisfy the Most Negative Moderator Temperature Coefficient Limit Report submittal requirement, the data to be used for calculating the revised predicted MTC may have to be taken 60 to 90 days prior to reaching 300 ppm boron. WCAP-13749-P-A does not provide any method for adjusting the revised predicted MTC to account for data collected 60 to 90 days prior to 300 ppm, nor does it provide justification for using such early data in the calculation. Therefore, the requirement to submit the Most Negative Moderator Temperature Coefficient Limit Report and the requirements for the data that go into the report are inconsistent.

Additionally, the Most Negative Moderator Temperature Coefficient Limit Report serves no apparent technical requirement. The benchmark criteria and the algorithm in WCAP-13749-P-A for determining the revised predicted MTC will be incorporated into the applicable procedures. There is no compelling reason that this particular Surveillance should require notifying the NRC prior to performing the Surveillance procedure.

The exception of not including a "Most Negative Moderator Temperature Coefficient Limit Report" that is contained in WCAP-13749-P-A was approved by the NRC for South Texas Units 1 and 2 in Amendment 144 to Facility Operating License No. NPF-76 and Amendment 132 to Facility Operating License No. NPF-80 dated November 26, 2002.

The fourth paragraph in Section 3.2.1 of WCAP-13749-P-A states:

> "As part of determining the applicability of a conditional exemption from the near-EOC MTC measurement, a cycle-specific figure similar to Figure 3-1 will be provided as part of that cycle's Technical Specifications or Core Operating Limits Report (COLR)."

However, the COLR changes contained in Appendix B, "COLR Revision," of WCAP-13749-P-A do not include a reference to Figure 3-1. SNC proposes to include the appropriate cycle-specific Figure 3-1 for FNP and VEGP, as well as the benchmark criteria in the surveillance procedure associated with the EOL MTC measurement and reference the surveillance procedure in the COLR.

5.0 Regulatory Evaluation

5.1 Applicable Regulatory Requirements/Criteria

10 CFR 50.36(c), "Technical specifications," requires Technical Specifications to be included for the following categories:

(1) Safety limits, limiting safety system settings, and limiting control settings.
(2) Limiting conditions for operation.
(3) Surveillance requirements.
(4) Design features.
(5) Administrative controls.

10 CFR 50.36(c) (3) Surveillance requirements, states:

"Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

None of the TS categories are impacted by the proposed TS changes, and SR 3.1.3.2 is not being deleted. The Bases for and values of the most negative MTC Limiting Condition for Operation and for the Surveillance Requirement are not altered. Instead, a revised prediction is compared to the MTC Surveillance limit to determine if the limit is met.

Therefore 10 CFR 50.36(c) continues to be met.

Appendix A to 10 CFR 50, General Design Criterion (GDC) 11, "Reactor inherent protection," states:

"The reactor core and associated coolant systems shall be designed so that in the power operating range the net effect of the prompt inherent nuclear feedback characteristics tends to compensate for a rapid increase in reactivity."

Neither the reactor core nor the RCS are being modified by the proposed TS, therefore GDC 11 continues to be met.

Therefore the proposed amendment does not impact the Regulatory Requirements discussed above.

5.2 Significant Hazards Consideration

The proposed changes revise the near-end of life (EOL) Moderator Temperature Coefficient (MTC) Surveillance Requirement (SR) 3.1.3.2 by placing a set of conditions on reactor core operation, which if met, would allow exemption from the required MTC measurement. The conditional exemption will be determined on a cycle-specific basis by considering the margin predicted to the surveillance requirement MTC limit and the performance of other reactor core parameters,

such as beginning of life (BOL) MTC measurements and the critical boron concentration as a function of cycle length.

As required by 10 CFR 50.91(a), Southern Nuclear Company (SNC) has evaluated the proposed changes to the FNP and VEGP TS using the criteria in 10 CFR 50.92 and has determined that the proposed changes do not involve a significant hazards consideration. An analysis of the issue of no significant hazards consideration is presented below:

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

Response: No

The safety analysis assumption of a constant moderator density coefficient and the actual value assumed are not changing. The Bases for and values of the most negative MTC Limiting Condition for Operation and for the Surveillance Requirement are not changing. Instead, a revised prediction is compared to the MTC Surveillance limit to determine if the limit is met.

The proposed changes to the TS do not affect the initiators of any analyzed accident. In addition, operation in accordance with the proposed TS changes ensures that the previously evaluated accidents will continue to be mitigated as analyzed. The proposed changes do not adversely affect the design function or operation of any structures, systems, and components important to safety.

The probability or consequences of accidents previously evaluated in the UFSAR are unaffected by this proposed change because there is no change to any equipment response or accident mitigation scenario. There are no new or additional challenges to fission product barrier integrity.

Therefore, it is concluded that the proposed 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 safety analysis assumption of a constant moderator density coefficient and the actual value assumed are not changing. The Bases for and values of the most negative MTC Limiting Condition for Operation and for the Surveillance Requirement are not changing. Instead, a revised prediction is compared to the MTC Surveillance limit to determine if the limit is met.

The proposed changes do not involve a physical alteration of the plant (no new or different type of equipment will be installed). The proposed changes do not create any new failure modes for existing equipment or any new limiting single failures. Additionally the proposed changes do not involve a change in the methods governing normal plant operation and all safety functions will continue to perform as previously assumed in accident analyses. Thus, the proposed changes do not adversely affect the design function or operation of any structures, systems, and components important to safety.

No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed changes. The proposed changes do not challenge the performance or integrity of any safety-related system.

Therefore, it is concluded that the proposed 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 safety analysis assumption of a constant moderator density coefficient and the actual value assumed are not changing. The Bases for and values of the most negative MTC Limiting Condition for Operation and for the Surveillance Requirement are not changing. Instead, a revised prediction is compared to the MTC Surveillance limit to determine if the limit is met.

The margin of safety associated with the acceptance criteria of any accident is unchanged. The proposed change will have no affect on the availability, operability, or performance of the safety-related systems and components. A change to a surveillance requirement is proposed based on an alternate method of confirming that the surveillance is met. The Technical Specification Limiting Condition for Operation (LCO) limits are not being changed.

The proposed change will not adversely affect the operation of plant equipment or the function of equipment assumed in the accident analysis.

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

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

5.3 Conclusions

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 Considerations

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 Part 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.

7.0 References

1. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.
2. WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," August 2004.
3. WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," August 2007.

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Enclosure 2

FNP Technical Specifications and Bases Markup Pages

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Verify MTC is within BOL limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	----------NOTES---------- 1. Not required to be performed until 7 effective full power days (EFPD) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. ~~2.~~ 3. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle. ~~3.~~ 4. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 100 ppm is less negative than the 100 ppm Surveillance limit specified in the COLR. ---------- Verify MTC is within EOL limit.	Once each cycle

2. SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR.

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

8. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997. (Methodology for LCO 3.1.3 - Moderator Temperature Coefficient.)

7. WCAP-11397-P-A "Revised Thermal Design Procedure," April 1989

(Methodology for LCO 2.1.1-Reactor Core Safety Limits, LCO 3.4.1-RCS Pressure, Temperature and Flow Departure from Nucleate Boiling Limits.)

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

a. The reactor coolant system pressure and temperature limits, including heatup and cooldown rates and the LTOP System applicability temperature, shall be established and documented in the PTLR for the following:

LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," and
LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System."

b. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in WCAP-14040-A, Revision 4, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," May 2004.

c. The PTLR shall be provided to the NRC upon issuance for each reactor fluence period and for any revision or supplement thereto.

5.6.7 EDG Failure Report

If an individual emergency diesel generator (EDG) experiences four or more valid failures in the last 25 demands, these failures shall be reported within 30 days. Reports on EDG failures shall include a description of the failures, underlying causes, and corrective actions taken per the Emergency Diesel Generator Reliability Monitoring Program.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.3.2

In similar fashion, the LCO demands that the MTC be less negative than the specified value for EOL full power conditions. This measurement may be performed at any THERMAL POWER, but its results must be extrapolated to the conditions of RTP and all banks withdrawn in order to make a proper comparison with the LCO value. Because the RTP MTC value will gradually become more negative with further core depletion and boron concentration reduction, a 300 ppm SR value of MTC should necessarily be less negative than the EOL LCO limit. The 300 ppm SR value is sufficiently less negative than the EOL LCO limit value to ensure that the LCO limit will be met when the 300 ppm Surveillance criterion is met.

SR 3.1.3.2 is modified by ~~three~~ four Notes that include the following requirements:

b. SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A (Ref. 4) are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR.

a. The SR is not required to be performed until 7 effective full power days (EFPDs) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm.

c. ~~b.~~ If the 300 ppm Surveillance limit is exceeded, it is possible that the EOL limit on MTC could be reached before the planned EOL. Because the MTC changes slowly with core depletion, the Frequency of 14 effective full power days is sufficient to avoid exceeding the EOL limit.

d. ~~c.~~ The Surveillance limit for RTP boron concentration of 100 ppm is conservative. If the measured MTC at 100 ppm is more positive than the 100 ppm Surveillance limit, the EOL limit will not be exceeded because of the gradual manner in which MTC changes with core burnup.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 11.
2. FSAR, Chapter 15.
3. WCAP 9273-NP-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

4. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

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Enclosure 3

FNP Technical Specifications Clean Typed Pages

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Verify MTC is within BOL limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	----------NOTES---------- 1. Not required to be performed until 7 effective full power days (EFPD) after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. 2. SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR. 3. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle. 4. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 100 ppm is less negative than the 100 ppm Surveillance limit specified in the COLR. ---------- Verify MTC is within EOL limit.	Once each cycle

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

7. WCAP-11397-P-A "Revised Thermal Design Procedure," April 1989

(Methodology for LCO 2.1.1-Reactor Core Safety Limits, LCO 3.4.1-RCS Pressure, Temperature and Flow Departure from Nucleate Boiling Limits.)

8. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

(Methodology for LCO 3.1.3 - Moderator Temperature Coefficient.)

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Reactor Coolant System (RCS) PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)

a. The reactor coolant system pressure and temperature limits, including heatup and cooldown rates and the LTOP System applicability temperature, shall be established and documented in the PTLR for the following:

LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," and
LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) System."

b. The analytical methods used to determine the RCS pressure and temperature limits shall be those previously reviewed and approved by the NRC, specifically those described in WCAP-14040-A, Revision 4, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," May 2004.

c. The PTLR shall be provided to the NRC upon issuance for each reactor fluence period and for any revision or supplement thereto.

(continued)

5.6 Reporting Requirements

5.6.7 EDG Failure Report

If an individual emergency diesel generator (EDG) experiences four or more valid failures in the last 25 demands, these failures shall be reported within 30 days. Reports on EDG failures shall include a description of the failures, underlying causes, and corrective actions taken per the Emergency Diesel Generator Reliability Monitoring Program.

5.6.8 PAM Report

When a report is required by Condition B or F of LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

5.6.9 Deleted

5.6.10 Steam Generator (SG) Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with the Specification 5.5.9, Steam Generator (SG) Program. The report shall include:

a. The scope of inspections performed on each SG,

b. Degradation mechanisms found,

c. Nondestructive examination techniques utilized for each degradation mechanism,

d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,

e. Number of tubes plugged during the inspection outage for each degradation mechanism,

f. The number and percentage of tubes plugged to date, and the effective plugging percentage in each steam generator.

g. The results of condition monitoring, including the results of tube pulls and in-situ testing.

5.6.11 Alternate AC (AAC) Source Out of Service Report

The NRC shall be notified if the AAC source is out of service for greater than 10 days.

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Enclosure 4

VEGP Technical Specifications and Bases Markup Pages

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Verify MTC is within BOL limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	----------NOTES---------- 1. Not required to be performed until 7 EFPD after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. ~~2.~~ 3. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle. ~~3.~~ 4. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of ≤ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR. ---------- Verify MTC is within EOL limit.	Once each cycle

2. SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR.

5.6 Reporting Requirements (continued)

5.6.5 Core Operating Limits Report (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

LCO 3.1.1 "SHUTDOWN MARGIN"
LCO 3.1.3 "Moderator Temperature Coefficient"
LCO 3.1.5 "Shutdown Bank Insertion Limits"
LCO 3.1.6 "Control Bank Insertion Limits"
LCO 3.2.1 "Heat Flux Hot Channel Factor"
LCO 3.2.2 "Nuclear Enthalpy Rise Hot Channel Factor"
LCO 3.2.3 "Axial Flux Difference"
LCO 3.9.1 "Boron Concentration"

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July 1985 (W Proprietary). (Methodology for Moderator Temperature Coefficient, Shutdown Bank Insertion Limit, Control Bank Insertion Limits, and Nuclear Enthalpy Rise Hot Channel Factor.)

WCAP-10216-P-A, Revision 1A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL FQ SURVEILLANCE TECHNICAL SPECIFICATION," February, 1994 (W Proprietary). (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor (W(Z) surveillance requirements for F_Q Methodology).)

WCAP-10266-P-A, Revision 2, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," March 1987.

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.3.1 (continued)

The BOL MTC value for ARO will be inferred from isothermal temperature coefficient measurements obtained during the physics tests after refueling. The ARO value can be directly compared to the BOL MTC limit of the LCO. If required, measurement results and predicted design values can be used to establish administrative withdrawal limits for control banks.

SR 3.1.3.2

In similar fashion, the LCO demands that the MTC be less negative than the specified value for EOL full power conditions. This measurement may be performed at any THERMAL POWER, but its results must be extrapolated to the conditions of RTP and all banks withdrawn in order to make a proper comparison with the LCO value. Because the RTP MTC value will gradually become more negative with further core depletion and boron concentration reduction, a 300 ppm SR value of MTC should necessarily be less negative than the EOL LCO limit. The 300 ppm SR value is sufficiently less negative than the EOL LCO limit value to ensure that the LCO limit will be met when the 300 ppm Surveillance criterion is met.

SR 3.1.3.2 is modified by ~~three~~ four Notes that include the following requirements:

a. The 300 ppm Surveillance limit must be verified within 7 EFPD after reaching the equivalent of an equilibrium RTP ARO boron concentration of 300 ppm. Seven effective full power days after reaching an equivalent boron concentration of 300 ppm are sufficient to ensure that the EOL limit will not be exceeded.

~~b.~~ c. If the 300 ppm Surveillance limit is exceeded, it is possible that the EOL limit on MTC could be reached before the planned EOL. Because the MTC changes slowly with core depletion, the Frequency of 14 effective full power days is sufficient to avoid exceeding the EOL limit.

b. SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A (Ref. 4) are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.1.3.2 (continued)

~~c.~~ d. The Surveillance limit for RTP boron concentration of 60 ppm is conservative. If the measured MTC at 60 ppm is more positive than the 60 ppm Surveillance limit, the EOL limit will not be exceeded because of the gradual manner in which MTC changes with core burnup.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 11.

2. FSAR, Chapter 15.

3. WCAP 9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

4. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

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Enclosure 5

VEGP Technical Specifications Clean Typed Pages

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.3.1	Verify MTC is within BOL limit.	Once prior to entering MODE 1 after each refueling
SR 3.1.3.2	----------NOTES---------- 1. Not required to be performed until 7 EFPD after reaching the equivalent of an equilibrium RTP all rods out (ARO) boron concentration of 300 ppm. 2. SR 3.1.3.2 is not required to be performed by measurement provided that the benchmark criteria in WCAP-13749-P-A are satisfied and the Revised Predicted MTC satisfies the 300 ppm surveillance limit specified in the COLR. 3. If the MTC is more negative than the 300 ppm Surveillance limit (not LCO limit) specified in the COLR, SR 3.1.3.2 shall be repeated once per 14 EFPD during the remainder of the fuel cycle. 4. SR 3.1.3.2 need not be repeated if the MTC measured at the equivalent of equilibrium RTP-ARO boron concentration of $\leq$ 60 ppm is less negative than the 60 ppm Surveillance limit specified in the COLR. ---------- Verify MTC is within EOL limit.	Once each cycle

5.6 Reporting Requirements (continued)

5.6.5 Core Operating Limits Report (COLR)

a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:

LCO 3.1.1 "SHUTDOWN MARGIN"
LCO 3.1.3 "Moderator Temperature Coefficient"
LCO 3.1.5 "Shutdown Bank Insertion Limits"
LCO 3.1.6 "Control Bank Insertion Limits"
LCO 3.2.1 "Heat Flux Hot Channel Factor"
LCO 3.2.2 "Nuclear Enthalpy Rise Hot Channel Factor"
LCO 3.2.3 "Axial Flux Difference"
LCO 3.9.1 "Boron Concentration"

b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

WCAP-9272-P-A, "WESTINGHOUSE RELOAD SAFETY EVALUATION METHODOLOGY," July 1985 (W Proprietary). (Methodology for Moderator Temperature Coefficient, Shutdown Bank Insertion Limit, Control Bank Insertion Limits, and Nuclear Enthalpy Rise Hot Channel Factor.)

WCAP-10216-P-A, Revision 1A, "RELAXATION OF CONSTANT AXIAL OFFSET CONTROL FQ SURVEILLANCE TECHNICAL SPECIFICATION," February, 1994 (W Proprietary). (Methodology for Axial Flux Difference (Relaxed Axial Offset Control) and Heat Flux Hot Channel Factor (W(Z) surveillance requirements for F_Q Methodology).)

WCAP-10266-P-A, Revision 2, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," March 1987.

WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

(continued)

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Enclosure 6

FNP Representative COLR Markups (for Information Only)

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC-approved methodologies, including those specified in Technical Specification 5.6.5.

2.1 SHUTDOWN MARGIN - MODES 1 and 2 (with $k_{eff} \geq 1.0$) (Technical Requirement 13.1.1)

2.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2 SHUTDOWN MARGIN - MODES 2 (with $k_{eff} < 1.0$), 3, 4 and 5 (Specification 3.1.1)

2.2.1 Modes 2 ($k_{eff} < 1.0$), 3 and 4 - The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2.2 Mode 5 - The SHUTDOWN MARGIN shall be greater than or equal to 1.0 percent $\Delta k/k$.

2.3 Moderator Temperature Coefficient (Specification 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO-MTC shall be less than or equal to $+0.7 \times 10^{-4}$ $\Delta k/k/°F$ for power levels up to 70 percent RTP with a linear ramp to 0 $\Delta k/k/°F$ at 100 percent RTP.

The EOL/ARO/RTP-MTC shall be less negative than -4.3×10^{-4} $\Delta k/k/°F$.

2.3.2 The MTC Surveillance limits are:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -3.65×10^{-4} $\Delta k/k/°F$.

Insert 1 →

The 100 ppm/ARO/RTP-MTC should be less negative than -4.0×10^{-4} $\Delta k/k/°F$.

where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
EOL stands for End of Cycle Life
RTP stands for RATED THERMAL POWER

2.4 Shutdown Bank Insertion Limits (Specification 3.1.5)

2.4.1 The shutdown banks shall be withdrawn to a position greater than or equal to 225 steps.

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC-approved methodologies, including those specified in Technical Specification 5.6.5.

2.1 SHUTDOWN MARGIN - MODES 1 and 2 (with $k_{eff} \geq 1.0$) (Technical Requirement 13.1.1)

2.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2 SHUTDOWN MARGIN - MODES 2 (with $k_{eff} < 1.0$), 3, 4 and 5 (Specification 3.1.1)

2.2.1 Modes 2 ($k_{eff} < 1.0$), 3 and 4 - The SHUTDOWN MARGIN shall be greater than or equal to 1.77 percent $\Delta k/k$.

2.2.2 Mode 5 - The SHUTDOWN MARGIN shall be greater than or equal to 1.0 percent $\Delta k/k$.

2.3 Moderator Temperature Coefficient (Specification 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO-MTC shall be less than or equal to $+0.7 \times 10^{-4}$ $\Delta k/k/°F$ for power levels up to 70 percent RTP with a linear ramp to 0 $\Delta k/k/°F$ at 100 percent RTP.

The EOL/ARO/RTP-MTC shall be less negative than -4.3×10^{-4} $\Delta k/k/°F$.

2.3.2 The MTC Surveillance limits are:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -3.65×10^{-4} $\Delta k/k/°F$.

Insert 1 →

The 100 ppm/ARO/RTP-MTC should be less negative than -4.0×10^{-4} $\Delta k/k/°F$.

where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
EOL stands for End of Cycle Life
RTP stands for RATED THERMAL POWER

2.4 Shutdown Bank Insertion Limits (Specification 3.1.5)

2.4.1 The shutdown banks shall be withdrawn to a position greater than or equal to 225 steps.

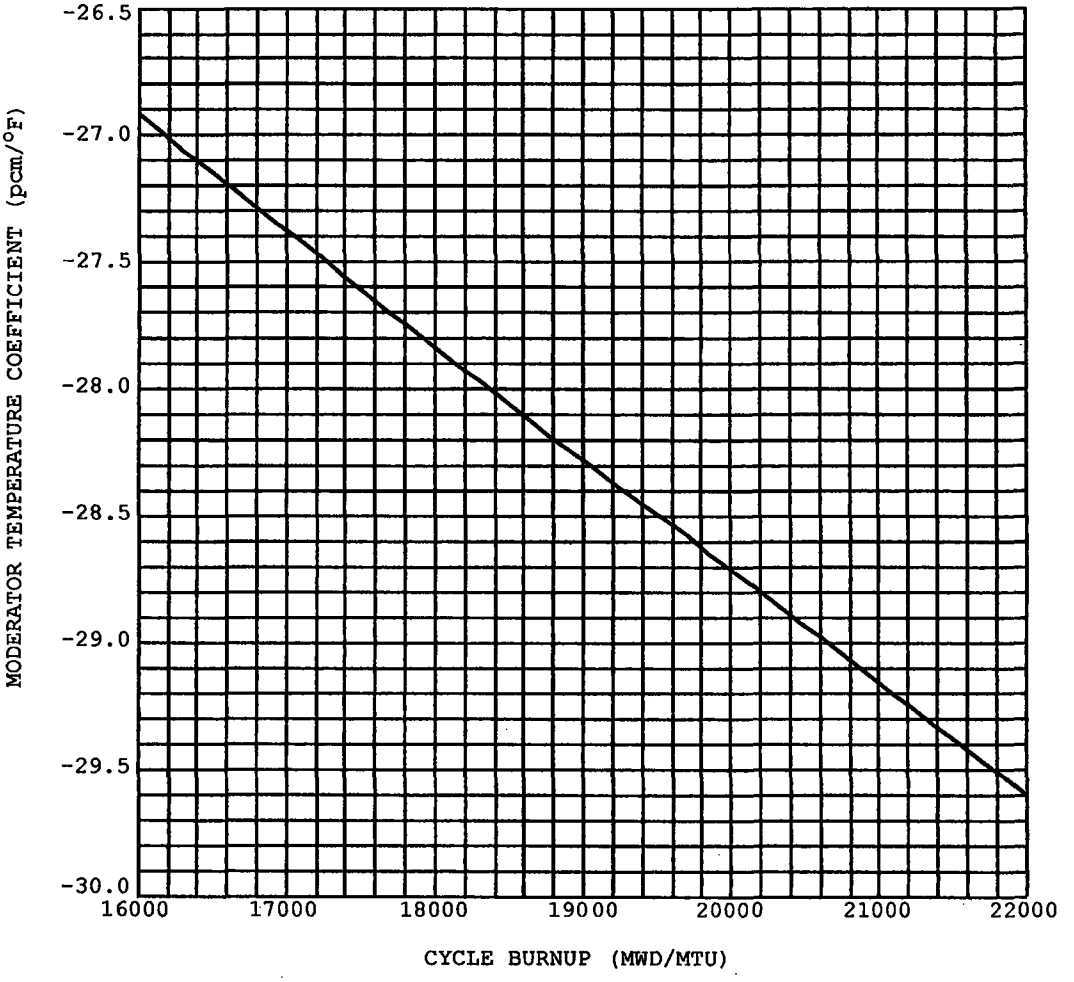
Insert 1

The Revised Predicted 300 ppm MTC shall be calculated using Figure 5 and the following algorithm:

Revised Predicted MTC = Predicted MTC + AFD Correction - Predictive Correction

If all of the benchmark data contained in the surveillance procedure are met and the Revised Predicted MTC satisfies the surveillance limit, then an MTC measurement in accordance with SR 3.1.3.2 is not required to be performed.

Figure 5
Predicted HFP 300 ppm MTC vs Cycle X Burnup



Cycle Burnup (MWD/MTU)	Moderator Temperature Coefficient (pcm/°F)
16000	-26.913
18000	-27.833
20000	-28.709
22000	-29.599

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Enclosure 7

VEGP Representative COLR Markups (for Information Only)

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC-approved methodologies including those specified in Technical Specification 5.6.5.

2.1 SHUTDOWN MARGIN - MODES 1 and 2 (Technical Requirement 13.1.1)

2.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.30 percent $\Delta k/k$.

2.2 SHUTDOWN MARGIN - MODES 3, 4 and 5 (Specification 3.1.1)

2.2.1 The SHUTDOWN MARGIN shall be greater than or equal to the limits shown in Figures 1 and 2.

2.3 Moderator Temperature Coefficient (Specification 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO/HZP-MTC shall be less positive than $+0.7 \times 10^{-4}$ $\Delta k/k/°F$ for power levels up to 70% RTP with a linear ramp to 0 $\Delta k/k/°F$ at 100% RTP.

The EOL/ARO/RTP-MTC shall be less negative than -5.50×10^{-4} $\Delta k/k/°F$.[1]

2.3.2 The MTC Surveillance limits are:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -4.75×10^{-4} $\Delta k/k/°F$.[1]

Insert 1 →

The 60 ppm/ARO/RTP-MTC should be less negative than -5.35×10^{-4} $\Delta k/k/°F$.[1]

where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
HZP stands for Hot Zero THERMAL POWER
EOL stands for End of Cycle Life
RTP stands for RATED THERMAL POWER

[1] Applicable for full-power T-average of 584.1 to 587.1 °F.

2.0 OPERATING LIMITS

The cycle-specific parameter limits for the specifications listed in Section 1.0 are presented in the following subsections. These limits have been developed using NRC-approved methodologies including those specified in Technical Specification 5.6.5.

2.1 SHUTDOWN MARGIN - MODES 1 and 2 (Technical Requirement 13.1.1)

2.1.1 The SHUTDOWN MARGIN shall be greater than or equal to 1.30 percent $\Delta k/k$.

2.2 SHUTDOWN MARGIN - MODES 3, 4 and 5 (Specification 3.1.1)

2.2.1 The SHUTDOWN MARGIN shall be greater than or equal to the limits shown in Figures 1 and 2.

2.3 Moderator Temperature Coefficient (Specification 3.1.3)

2.3.1 The Moderator Temperature Coefficient (MTC) limits are:

The BOL/ARO/HZP-MTC shall be less positive than $+0.7 \times 10^{-4}$ $\Delta k/k/°F$ for power levels up to 70% RTP with a linear ramp to 0 $\Delta k/k/°F$ at 100% RTP.

The EOL/ARO/RTP-MTC shall be less negative than -5.50×10^{-4} $\Delta k/k/°F$.[1]

2.3.2 The MTC Surveillance limits are:

The 300 ppm/ARO/RTP-MTC should be less negative than or equal to -4.75×10^{-4} $\Delta k/k/°F$.[1]

Insert 1 →

The 60 ppm/ARO/RTP-MTC should be less negative than -5.35×10^{-4} $\Delta k/k/°F$.[1]

where: BOL stands for Beginning of Cycle Life
ARO stands for All Rods Out
HZP stands for Hot Zero THERMAL POWER
EOL stands for End of Cycle Life
RTP stands for RATED THERMAL POWER

[1] Applicable for full-power T-average of 583.8 to 586.8 °F.

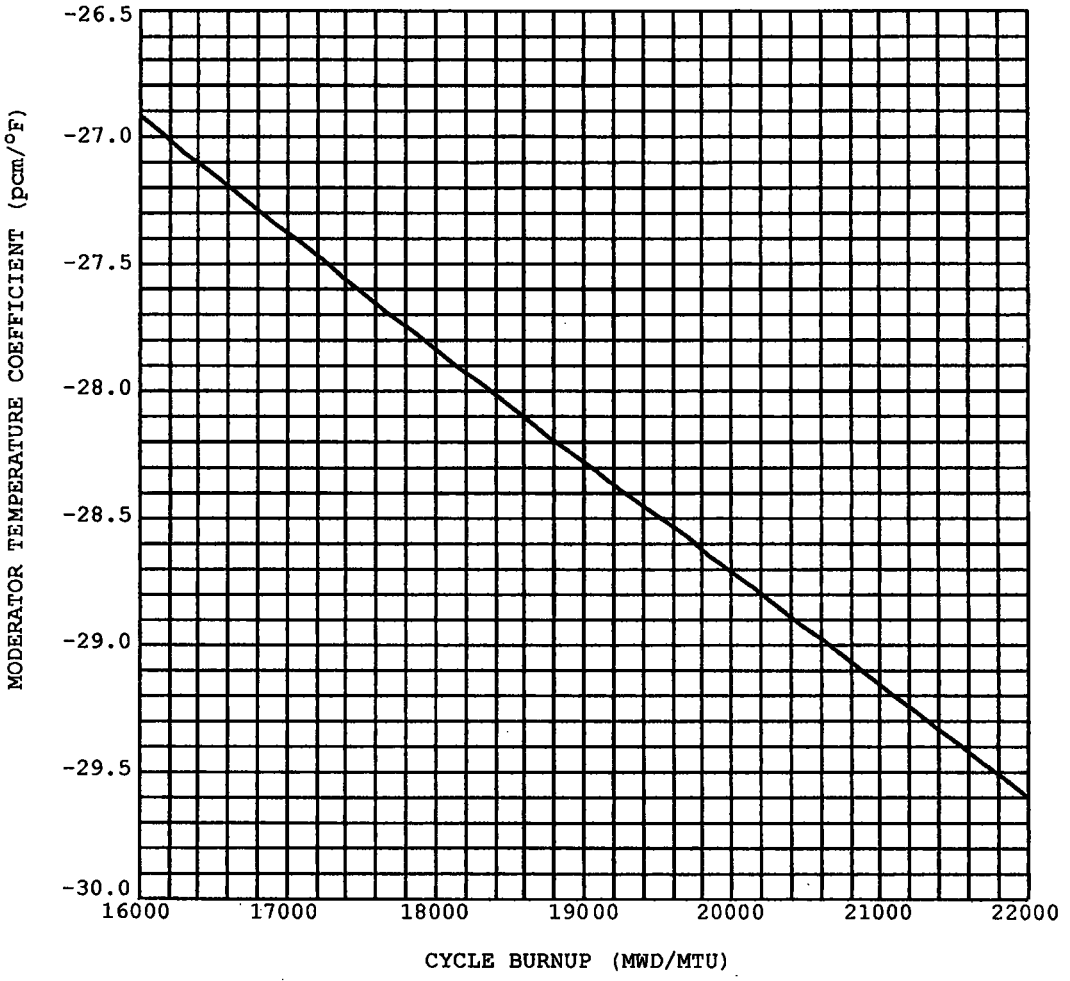
Insert 1

The Revised Predicted 300 ppm MTC shall be calculated using Figure 6 and the following algorithm:

Revised Predicted MTC = Predicted MTC + AFD Correction - Predictive Correction

If all of the benchmark data contained in the surveillance procedure are met and the Revised Predicted MTC satisfies the surveillance limit, then an MTC measurement in accordance with SR 3.1.3.2 is not required to be performed.

Figure 6
Predicted HFP 300 ppm MTC vs Cycle X Burnup



Cycle Burnup (MWD/MTU)	Moderator Temperature Coefficient (pcm/°F)
16000	-26.913
18000	-27.833
20000	-28.709
22000	-29.599

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Enclosure 8

Westinghouse Affidavit Requesting Withholding of Enclosure 9

Westinghouse Electric Company
Engineering, Equipment and Major Projects
1000 Westinghouse Drive, Building 3
Cranberry Township, Pennsylvania 16066
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Direct tel: (412) 374-4643
Direct fax: (724) 940-8560
e-mail: greshaja@westinghouse.com

CAW-14-3973

May 29, 2014

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: Southern Nuclear Operating Company (SNC) letter NL-14-0115, "License Amendment Request to Revise Technical Specification Surveillance Requirement 3.1.3.2 and Specification 5.6.5," Enclosure 9, "SNC Response to BVPS RAI Questions" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-14-3973 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The Affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by Southern Nuclear Operating Company (SNC).

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse Affidavit should reference CAW-14-3973 and should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

Very truly yours,

James A. Gresham, Manager
Regulatory Compliance

Enclosures

CAW-14-3973

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

Before me, the undersigned authority, personally appeared Bradley F. Maurer, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Bradley F. Maurer, Principal Engineer
Plant Licensing

Sworn to and subscribed before me
this 29th day of May 2014

Joyce A Szepessy
Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Joyce A. Szepessy, Notary Public
Parks Twp., Armstrong County
My Commission Expires April 16, 2017
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

(1) I am Principal Engineer, Plant Licensing, in Engineering, Equipment and Major Projects, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse Application for Withholding Proprietary Information from Public Disclosure accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use 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 a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in Southern Nuclear Operating Company (SNC) letter NL-14-0115, "License Amendment Request to Revise Technical Specification Surveillance Requirement 3.1.3.2 and Specification 5.6.5," Enclosure 9, "SNC Response to BVPS RAI Questions" (Proprietary) for submittal to the Commission, being transmitted by Southern Nuclear Operating Company (SNC) letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with SNC's request for NRC approval of a License Amendment Request that would allow a change to the Technical Specifications to provide a conditional exemption from Moderator Temperature Coefficient measurement, and may be used only for that purpose.

(a) This information is part of that which will enable Westinghouse to:

(i) Assist SNC with obtaining NRC approval of a License Amendment Request that would allow a change to the Technical Specifications to provide a conditional exemption from Moderator Temperature Coefficient measurement.

(ii) Provide results of customer specific calculations.

(iii) Provide licensing support for customer submittals.

(b) Further this information has substantial commercial value as follows:

(i) Westinghouse plans to sell the use of this information to its customers for purposes of meeting NRC requirements for licensing documentation associated with End of Life Moderator Temperature Coefficient Elimination submittals.

(ii) Westinghouse can sell support and defense of the use of the technology to its customers in the licensing process.

(iii) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar technical justifications and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the Affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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Joseph M. Farley Nuclear Plant – Units 1 and 2
Vogtle Electric Generating Plant – Units 1 and 2
License Amendment Request to Revise Technical Specification
Surveillance Requirement 3.1.3.2 and Specification 5.6.5

Enclosure 10

SNC Response to BVPS RAI Questions (Non-Proprietary)

NRC RAI Question 1

In accordance with the second condition in the NRC staff's safety evaluation for WCAP-13749-P-A, the licensee proposed to confirm, on a cycle-specific basis, that core fuel design changes or data from MTC predictions and measurements do not show a significant effect on the predictive correction. Please clarify the process and criteria for making this determination and justify their adequacy (e.g., statistical testing, engineering judgment, etc).

SNC Response to NRC RAI Question 1

As described in WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," approved in March 1997, the HFP predictive correction accounts for the observed differences between the measured and predictive (M-P) MTCs. The hot full power (HFP) predictive correction ([ ]^{a,c}) was derived by summing the hot zero power (HZP) predictive correction, the xenon sensitivity, and the burnup sensitivity. The HZP predictive correction is provided in WCAP-13749-P-A.

The tables below provide BOL HZP MTC measured values (MTC M), predicted values (MTC P), and the measured minus the predicted values (M-P) for each cycle listed for FNP Units 1 and 2 and VEGP Unit 1 and 2. The MTC M-P for all four units is consistently within the BOC HZP ITC benchmark criteria, and therefore is conservative for evaluating the continued use of the HFP predictive correction value of [ ]^{a,c}.

Table 1: Farley Unit 1 BOL HZP MTC Data (all values in pcm/°F)

Cycle	MTC M	MTC P	M-P
16	1.83	[ ]^{a,c}	[ ]^{a,c}
17	2.75	[ ]^{a,c}	[ ]^{a,c}
18	2.57	[ ]^{a,c}	[ ]^{a,c}
19	1.99	[ ]^{a,c}	[ ]^{a,c}
20	1.55	[ ]^{a,c}	[ ]^{a,c}
21	1.38	[ ]^{a,c}	[ ]^{a,c}
22	2.14	[ ]^{a,c}	[ ]^{a,c}
23	2.64	[ ]^{a,c}	[ ]^{a,c}
24	3.59	[ ]^{a,c}	[ ]^{a,c}
25	1.72	[ ]^{a,c}	[ ]^{a,c}
26	1.23	[ ]^{a,c}	[ ]^{a,c}

Table 2: Farley Unit 2 BOL HZP MTC Data (all values in pcm/°F)

Cycle	MTC M	MTC P	M-P
13	1.31	[ ]^{a,c}	[ ]^{a,c}
14	2.06	[ ]^{a,c}	[ ]^{a,c}
15	2.49	[ ]^{a,c}	[ ]^{a,c}
16	1.48	[ ]^{a,c}	[ ]^{a,c}
17	1.55	[ ]^{a,c}	[ ]^{a,c}
18	0.80	[ ]^{a,c}	[ ]^{a,c}
19	1.07	[ ]^{a,c}	[ ]^{a,c}
20	0.41	[ ]^{a,c}	[ ]^{a,c}
21	2.36	[ ]^{a,c}	[ ]^{a,c}
22	1.12	[ ]^{a,c}	[ ]^{a,c}
23	1.34	[ ]^{a,c}	[ ]^{a,c}

Table 3: Vogtle Unit 1 BOL HZP MTC Data (all values in pcm/°F)

Cycle	MTC M	MTC P	M-P
9	1.48	[ ]^{a,c}	[ ]^{a,c}
10	0.49	[ ]^{a,c}	[ ]^{a,c}
11	2.38	[ ]^{a,c}	[ ]^{a,c}
12	0.44	[ ]^{a,c}	[ ]^{a,c}
13	-0.37	[ ]^{a,c}	[ ]^{a,c}
14	1.27	[ ]^{a,c}	[ ]^{a,c}
15	0.87	[ ]^{a,c}	[ ]^{a,c}
16	-2.67	[ ]^{a,c}	[ ]^{a,c}
17	-0.62	[ ]^{a,c}	[ ]^{a,c}
18	-2.45	[ ]^{a,c}	[ ]^{a,c}

Table 4: Vogtle Unit 2 BOL HZP MTC Data (all values in pcm/°F)

Cycle	MTC M	MTC P	(M-P)
8	0.34	[ ]^{a,c}	[ ]^{a,c}
9	0.99	[ ]^{a,c}	[ ]^{a,c}
10	-0.89	[ ]^{a,c}	[ ]^{a,c}
11	0.82	[ ]^{a,c}	[ ]^{a,c}
12	1.12	[ ]^{a,c}	[ ]^{a,c}
13	-0.67	[ ]^{a,c}	[ ]^{a,c}
14	-0.23	[ ]^{a,c}	[ ]^{a,c}
15	-2.45	[ ]^{a,c}	[ ]^{a,c}
16	-1.82	[ ]^{a,c}	[ ]^{a,c}
17	-2.33	[ ]^{a,c}	[ ]^{a,c}

WCAP-13749-P-A states, "...the (HFP) predictive correction is reexamined if changes in core fuel designs or continued MTC calculation/measurement data show significant effect on the predictive correction." SNC would verify that the predictive correction remains valid for the applicable fuel cycle by performing the following two qualitative assessments.

1. SNC would identify fuel and core design methodology changes during the Cycle Planning and Risk Assessment (CPRA) meeting between Westinghouse and SNC. Prior to each reload, the CPRA meeting is used to identify and determine the risk of major fuel design changes or core design methodology changes. This meeting would identify whether the reload will use revised or different methodologies, and assesses the impact of these changes on the existing analyses. Additionally, prior to accepting the Westinghouse core design calculations, SNC uses an internal checklist for the review and acceptance of these calculations. This checklist will help ensure reasonableness to the BOC HZP MTC prediction prior to the startup of each cycle based on a comparison of past results.

2. Per TS 3.1.3, each cycle during low power physics testing, SNC measures the BOL HZP MTC. Prior to each conditional exemption of the end of life (EOL) HFP MTC measurement test, SNC would compare FNP and VEGP specific MTC (M-P) data each cycle against previous cycles to determine if there is a change to the measured vs. predicted MTC relationship.

If the value of the BOL HZP MTC (M-P) approaches the HZP predictive correction acceptance criteria given in WCAP-13749-P-A, then SNC would evaluate the use of the HFP MTC predictive correction to show that the value of [ ]^{a,c} is conservative or measure the EOL HFP MTC in accordance with the Technical Specifications. The above tools and assessments would be used each cycle during and after the transition to NEXUS/ANC9 (PARAGON) to verify continued consistency and validity of the BOL HZP MTC (M-P) relationship as it pertains to the predictive correction of WCAP-13749-P-A.

NRC RAI Question 2

The predictive correction term defined in WCAP-13749-P-A is based, in part, on a tolerance limit that Westinghouse derived from differences between a set of measured and predicted values of the MTC at the beginning of an operating cycle at hot, zero-power conditions. Specifically, the predicted MTC values in WCAP-13749-P-A were determined from calculations using the PHOENIX-P/ANC code package for a variety of pressurized-water reactor (PWR) core designs prior to 1995. Although the NRC staff has approved the PARAGON lattice physics code as a replacement to PHOENIX-P, it cannot not be concluded that the statistical database, and hence the predictive correction terms, for the two codes will be equivalent. Therefore, if approval for the use of the predictive correction term derived for the PHOENIX-P code for calculations with the PARAGON code is sought under this license amendment request, please provide unbiased and statistically significant data analogous to that reported in Table 3-1 of WCAP-13749-P-A for calculations performed with the PARAGON code for contemporary PWR core designs, along with: (1) justification that this data belongs to the same population as the pre-1995 data in WCAP-13749-P-A, generated with the PHOENIX-P code; or (2) a new predictive correction term for the PARAGON code for contemporary cores that is based on a 95/95 tolerance limit appropriate for modifying end-of-cycle MTC predictions made with this code.

SNC Response to NRC RAI Question 2

A database of plants is used for regression testing and continued qualification of core design system code releases. This database consists of multiple cycles of plants chosen to encompass the variety of plant, fuel lattice types, and fuel management strategies that the code will be used to analyze. Comparison of the results for any release with those of previous releases assures continued compliance of the code with its licensing basis.

This set of contemporary PWR cores (including Farley) has been selected as representative of the statistical database used in WCAP-13749-P-A. These cores have been modeled using both PHOENIX-P/ANC and NEXUS/ANC (the NEXUS cross-section generation system uses PARAGON as the lattice transport code).

Table 1 below lists data analogous to that reported in Table 3-1 of WCAP-13749-P-A for calculations performed with NEXUS/ANC. Benchmarks for both PHOENIX-P/ANC and NEXUS/ANC are listed in the table to show a comparison between the two code sets. Measured End-Of-Cycle (EOC) Hot Full Power (HFP) Moderator Temperature Coefficient (MTC) data is not readily available for most of the benchmark cores and this data is not used in determining the predictive correction term, therefore this data is not included. Additionally, Beginning-of-Cycle (BOC) Hot Zero Power (HZP) Isothermal Temperature Coefficient (ITC) data was included instead of BOC HZP MTC data as the measured BOC HZP MTC is just the predicted BOC HZP Doppler Temperature Coefficient (DTC) subtracted from the measured BOC HZP ITC.

The results in Table 1 show that [

]a,c Using the measured-minus-predicted values in Table 1, the predictive correction term from WCAP- 13749-P-A [ ]a,c

Using commercial statistics software, the BOC HZP ITC M-P data points in Table 1 have been demonstrated to fall within a normal distribution per the Anderson-Darling and Ryan-Joiner tests, with a M-P mean of [ ]a,c pcm/°F and a standard deviation of [ ]a,c pcm/°F. From this data, a 95/95 one-sided tolerance limit for the HZP predictive correction of [ ]a,c pcm/°F can be calculated using a K-value of [ ]a,c

Applying [ ]a,c from WCAP-13749-P-A [ ]a,c yields a HFP predictive correction of [ ]a,c pcm/°F. [

]a,c

Additionally, the predictive correction term for PHOENIX-P/ANC was recalculated for comparison (for contemporary cores). [ ]a,c using the K-value of [ ]a,c a HZP predictive correction of [ ]a,c pcm/°F was calculated. [ ]a,c yields a HFP predictive correction of [ ]a,c pcm/°F. [ ]a,c This shows that: (1) the PHOENIX-P/ANC results in WCAP-13749-P-A are reproducible with the contemporary PWR cores and latest code versions, and (2) the set of cores chosen represents a good unbiased sample of the larger data set used in WCAP-13749-P-A.

Table 1: Summary of Statistics for Measured Minus Predicted Differences of Critical boron, ITC, MTC, and Rod Worths for Westinghouse Cores

Parameter	PHOENIX/P/ANC		NEXUS/ANC		No. Pts
	Mean	Std Dev	Mean	Std Dev	
					a, c