Entergy

Entergy Nuclear Vermont Yankee, LLC
Entergy Nuclear Operations, Inc.
185 Old Ferry Road
Brattleboro, VT 05302-0500

December 5, 2003
BVY 03-114

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

Subject: **Vermont Yankee Nuclear Power Station**
License No. DPR-28 (Docket No. 50-271)
Technical Specification Proposed Change No. 264
<u>Safety Limit Minimum Critical Power Ratio (SLMCPR) Change</u>

Pursuant to 10CFR50.90, Vermont Yankee[1] (VY) hereby proposes to amend its Facility Operating License, DPR-28, by incorporating the attached proposed change into the Technical Specifications (TS) of Vermont Yankee Nuclear Power Station. This proposed change provides revised values for the Safety Limit Minimum Critical Power Ratio (SLMCPR) for both single and dual recirculation loop operation.

Attachment 1 to this letter contains supporting information and the safety assessment of the proposed change. Attachment 2 contains the determination of no significant hazards consideration. Attachment 3 provides the marked-up version of the current Technical Specification pages. Attachment 4 contains the retyped Technical Specification pages. Attachment 5 of the enclosed information is a summary of the technical bases for the SLMCPR values and is considered proprietary information by Global Nuclear Fuels – Americas, LLC (GNF). In accordance with 10CFR2.790(b)(1), an affidavit attesting to the proprietary nature of the enclosed information and requesting withholding from public disclosure is included with Attachment 5. Attachment 6 is the same GNF summary with the proprietary information removed, and is provided for public disclosure.

VY has reviewed the proposed Technical Specification change in accordance with 10CFR50.92 and concludes that the proposed change does not involve a significant hazards consideration.

VY has evaluated the proposed amendment against the criteria of 10CFR51.22 for environmental considerations and believes that the proposed change is eligible for categorical exclusion from the requirements for an environmental review in accordance with 10CFR51.22(c)(9).

Regarding our proposed schedule for this amendment, we request your review and approval of the revised SLMCPR by March 2004 with a 60-day implementation period, to coincide with our refueling outage.

A001

Rec'd 3/3/04

If you have any questions concerning this transmittal or require additional information, please contact Mr. Jeffrey T. Meyer at (802) 258-4105.

Sincerely,

Jay K. Thayer
Site Vice President

STATE OF VERMONT)
)ss
WINDHAM COUNTY)

Then personally appeared before me, Jay K. Thayer, who, being duly sworn, did state that he is Site Vice President of the Vermont Yankee Nuclear Power Station, that he is duly authorized to execute and file the foregoing document, and that the statements therein are true to the best of his knowledge and belief.

Sally A. Sandstrum, Notary Public
My Commission Expires February 10, 2007

Attachments

cc: USNRC Region 1 Administrator
USNRC Resident Inspector - VYNPS
USNRC Project Manager - VYNPS
Vermont Department of Public Service (w/o proprietary information)

Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 264

Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Supporting Information and Safety Assessment of Proposed Change

Description of the Proposed Change

Pursuant to 10CFR50.90, Vermont Yankee proposes to amend Appendix A, Technical Specification (TS) Section 1.1.A.1 of Facility Operating License DPR-28. The proposed changes to the Technical Specifications are as follows:

Page 6, Specification 1.1.A.1 – Replace the listed SLMCPR values of 1.10 (1.12 for single loop operation) with new values of 1.07 (1.09 for single loop operation).

Purpose of the Proposed Change

Cycle specific calculations for Vermont Yankee by Global Nuclear Fuels (GNF) is summarized in Attachment 5. The current SLMCPR values for dual and single loop operation contained in the Technical Specifications (1.10 and 1.12 respectively) are not applicable for the upcoming fuel cycle due to core loading design and fuel type changes. Based upon the core loading and fuel design changes, the cycle specific SLMCPR values were determined to be 1.07 for dual loop and 1.09 for single loop operation.

Safety Assessment of Proposed Change

The purpose of the SLMCPR is to provide high statistical probability (99.9%) that fuel rods in the operating core would not experience transition boiling during the most limiting Abnormal Operational Transient (AOT). The criteria of transition boiling for determination of the SLMCPR is a conservative approach since this phenomena by itself does not signal the onset of fuel cladding failure. The revised SLMCPR for Vermont Yankee was determined using plant and cycle-specific fuel and core parameters and NRC approved methodology, as discussed in Attachment 5 (GNF proprietary summary of technical basis for SLMCPR) and Attachment 6 (non-proprietary version of GNF summary). Analysis of the limiting AOT provides the allowed operating conditions, in terms of MCPR, of the core during the fuel cycle such that if the event were to occur, the transient MCPR would not be less than the SLMCPR. No plant hardware or operational changes are required with this proposed change.

Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 264

Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Determination of No Significant Hazards Consideration

No Significant Hazard Determination

Pursuant to 10CFR50.92, Vermont Yankee has reviewed the proposed change and concludes that the change does not involve a significant hazards consideration since the proposed change satisfies the criteria in 10CFR50.92(c). These criteria require that operation of the facility in accordance with the proposed amendment will not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. The discussion below addresses each of these criteria and demonstrates that the proposed amendment does not constitute a significant hazard.

The proposed change does not involve a significant hazards consideration because:

1. <u>The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment, will not involve a significant increase in the probability or consequences of an accident previously evaluated.</u>

   The basis of the Safety Limit Minimum Critical Power Ratio (SLMCPR) is to ensure no mechanistic fuel damage is calculated to occur if the limit is not violated. The new SLMCPR values preserve the existing margin to transition boiling and probability of fuel damage is not increased. The derivation of the revised SLMCPR for Vermont Yankee for incorporation into the Technical Specifications, and its use to determine plant and cycle-specific thermal limits, have been performed using NRC approved methods. These plant-specific calculations are performed each operating cycle and if necessary, will require future changes to these values based upon revised core designs. The revised SLMCPR values do not change the method of operating the plant and have no effect on the probability of an accident initiating event or transient.

   Based on the above, Vermont Yankee has concluded that the proposed change will not result in a significant increase in the probability or consequences of an accident previously evaluated.

2. <u>The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment, will not create the possibility of a new or different kind of accident from any accident previously evaluated.</u>

   The proposed changes result only from a specific analysis for the Vermont Yankee core reload design. These changes do not involve any new or different methods for operating the facility. No new initiating events or transients result from these changes.

   Based on the above, Vermont Yankee has concluded that the proposed change will not create the possibility of a new or different kind of accident from those previously evaluated.

3. <u>The operation of Vermont Yankee Nuclear Power Station in accordance with the proposed amendment, will not involve a significant reduction in a margin of safety.</u>

   The new SLMCPR is calculated using NRC approved methods with plant and cycle specific parameters for the current core design. The SLMCPR value remains high enough to ensure that greater than 99.9% of all fuel rods in the core will avoid transition boiling if the limit is not violated, thereby preserving the fuel cladding integrity. The operating MCPR limit is set appropriately above the safety limit value to ensure adequate margin when the cycle specific transients are evaluated. Accordingly, the margin of safety is maintained with the revised values.

As a result, Vermont Yankee has determined that the proposed change will not result in a significant reduction in a margin of safety.

On the basis of the above, Vermont Yankee has determined that operation of the facility in accordance with the proposed change does not involve a significant hazards consideration as defined in 10CFR50.92(c), in that it: (1) does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) does not involve a significant reduction in a margin of safety.

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Attachment 3

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 264

Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Marked-up Version of the Current Technical Specifications

1.1 SAFETY LIMIT

1.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to the interrelated variable associated with fuel thermal behavior.

Objective:

To establish limits below which the integrity of the fuel cladding is preserved.

Specification:

A. Bundle Safety Limit (Reactor Pressure >800 psia and Core Flow >10% of Rated)

When the reactor pressure is >800 psia and the core flow is greater than 10% of rated:

1. A Minimum Critical Power Ratio (MCPR) of less than ~~1.10~~ 1.07 (~~1.12~~ 1.09 for Single Loop Operation) shall constitute violation of the Fuel Cladding Integrity Safety Limit (FCISL).

2.1 LIMITING SAFETY SYSTEM SETTING

2.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to trip setting of the instruments and devices which are provided to prevent the nuclear system safety limits from being exceeded.

Objective:

To define the level of the process variable at which automatic protective action is initiated.

Specification:

A. Trip Settings

The limiting safety system trip settings shall be as specified below:

1. Neutron Flux Trip Settings

a. APRM Flux Scram Trip Setting (Run Mode)

When the mode switch is in the RUN position, the APRM flux scram trip setting shall be as shown on Figure 2.1.1 and shall be:

$$S \leq 0.66(W-\Delta W)+54\%$$

where:

S = setting in percent of rated thermal power (1593 MWt)

W = percent rated two loop drive flow where 100% rated drive flow is that flow equivalent to 48 x 10^6 lbs/hr core flow

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Attachment 4

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 264

Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Retyped Technical Specification Pages

1.1 SAFETY LIMIT

1.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to the interrelated variable associated with fuel thermal behavior.

Objective:

To establish limits below which the integrity of the fuel cladding is preserved.

Specification:

A. Bundle Safety Limit (Reactor Pressure >800 psia and Core Flow >10% of Rated)

When the reactor pressure is >800 psia and the core flow is greater than 10% of rated:

1. A Minimum Critical Power Ratio (MCPR) of less than 1.07 (1.09 for Single Loop Operation) shall constitute violation of the Fuel Cladding Integrity Safety Limit (FCISL).

2.1 LIMITING SAFETY SYSTEM SETTING

2.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to trip setting of the instruments and devices which are provided to prevent the nuclear system safety limits from being exceeded.

Objective:

To define the level of the process variable at which automatic protective action is initiated.

Specification:

A. Trip Settings

The limiting safety system trip settings shall be as specified below:

1. Neutron Flux Trip Settings

a. APRM Flux Scram Trip Setting (Run Mode)

When the mode switch is in the RUN position, the APRM flux scram trip setting shall be as shown on Figure 2.1.1 and shall be:

$$S \leq 0.66(W-\Delta W)+54\%$$

where:

S = setting in percent of rated thermal power (1593 MWt)

W = percent rated two loop drive flow where 100% rated drive flow is that flow equivalent to 48 x 10^6 lbs/hr core flow

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Attachment 6

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 264

GNF Summary of Technical Basis for SLMCPR Values

(Non-Proprietary Version)

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 Vermont Yankee Cycle 24 and 23 SLMCPR Values

Table 1 summarizes the relevant input parameters and results of the SLMCPR determination for the Vermont Yankee Cycle 24 and 23 cores. The bases for the power distribution uncertainties are also indicated in Table 1. Table 2 provides a more detailed presentation of the bases and results for the Cycle 24 and Cycle 23 analyses. The affect on the calculated SLMCPR of the change from GETAB to Reduced power uncertainties is summarized in Table 2. The SLMCPR evaluations were performed using NRC approved methods and uncertainties[1]. These evaluations yield different calculated SLMCPR values because different inputs were used. The quantities that have been shown to have some impact on the determination of the safety limit MCPR (SLMCPR) are provided.

In comparing the Vermont Yankee Cycle 24 and 23 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. The GETAB and reduced power distribution uncertainty columns for Cycle 24 are both provided for comparison to the Cycle 23 GETAB power distribution uncertainty column.

In general, the calculated safety limit is dominated by [[[3]]] (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.

[[

[3]]].

The uncontrolled bundle pin-by-pin power distributions were compared between the Vermont Yankee Cycle 24 bundles and the Cycle 23 bundles. Pin-by-pin power distributions are characterized in terms of R-factors using the NRC approved methodology[2]. For the Vermont Yankee Cycle 24 limiting case analyzed at EOR-1.0K, [[

[3]]] the Vermont Yankee Cycle 24 bundles are flatter than the bundles used for the Cycle 23 SLMCPR analysis.

As indicated in Table 1, the NRC approved[1] revised non-power distribution uncertainties have been assumed for the Vermont Yankee Cycle 24 analyses.

With a flatter core MCPR distribution in Cycle 24 than in Cycle 23, and a flatter bundle R-factor distribution in Cycle 24 relative to the Cycle 23 bundles, it would be expected that the Cycle 24 SLMCPR result would be greater than the Cycle 23 result. Table 1 shows that when using the same uncertainties the Cycle 24 SLMCPR is greater than the Cycle 23 SLMCPR. Table 2, which shows these same values to greater precision, confirms that the Cycle 24 result is greater than the Cycle 23 value.

As indicated in Table 1, the NRC approved[1] standard GETAB and reduced power distribution uncertainties have both been assumed for the Vermont Yankee Cycle 24 analyses. For the Cycle 23 case, the standard GETAB power distribution uncertainties were used. Use of the reduced power distribution uncertainties results in a reduction of the SLMCPR by approximately 0.04.

Comparison of the GETAB and Reduced Uncertainties

The power distribution and other uncertainties that are the bases for the proposed TS safety limit for Vermont Yankee Cycle 24 are identified in Table 2. Column 2 of Table 2 shows the power distribution and other uncertainties that are the bases for the current TS safety limit for Vermont Yankee Cycle 23. The revised bases to support the proposed change in TS safety limit for Vermont Yankee Cycle 24 are identified in column 3b of Table 2. The GETAB bases and values for Cycle 24 are provided for comparison purposes in column 3a. By comparing the values from column 2 for Cycle 23 and column 3a for Cycle 24, one may see that the calculated SLMCPR for Cycle 24 is higher [[[3]]] than the value for Cycle 23 when using the same GETAB model and uncertainties for both calculations. Thus, the focus for Table 2 is on how the revised model and reduced power distribution uncertainties affect the calculated SLMCPR for Vermont Yankee, Cycle 24 (only).

The revised model and reduced power distribution uncertainties affect the calculated SLMCPR for Vermont Yankee Cycle 24 as indicated in Table 2. Bases that have not changed are not reported in either table except where it is important to indicate that the bases have not changed. For these exceptions, the impact on the SLMPCR is indicated as "None" in the rightmost column of Table 2. For the other items where a change in basis is indicated, the calculated impact that each item has on the calculated SLMCPR is indicated.

The impacts from the changes in bases have been grouped into three categories. In each category the shaded cells contain values that sum to produce the total impact for that category indicated in the cell immediately below the shaded cells.

In Section 1 of Table 2 the impact of using the "revised uncertainties not related to power distribution" is indicated as "None" since the same revised uncertainties were used for both the GETAB calculation (Column 3a) and the revised calculation (Column 3b).

The largest change in the calculated SLMCPR is the reduction that is due to use of the NRC-approved revised power distribution model and its associated reduced uncertainties as described in NEDC-32694P-A. The increase in the R-factor uncertainty resulted in an SLMCPR increase of [[ ]]. For Vermont Yankee Cycle 24 the calculated SLMCPR was reduced by [[{3}]] as indicated in Section 2 of Table 2.

For Vermont Yankee Cycle 24, both the GETAB calculation and the revised calculation use the same limiting rod patterns, [[{3}]] Therefore, in Section 3 of Table 2 the "Secondary impact on SLMCPR because reduced SLMCPR causes a lower OLMCPR" is indicated as [[{3}]].

The total impact is that the SLMCPR as calculated using NRC-approved methods, inputs and procedures decreases by [[{3}]]. This amount of improvement is consistent with the expected improvements as presented to the NRC in Table 4.3 of NEDC-32694P-A. Of this improvement, about [[{3}]] is attributed to the reduced uncertainties themselves and the remaining [[{3}]] is attributed to the methodology improvements described in NEDC-32694P-A.

Reduction in the Tech Spec SLMCPRs by these calculated amounts is warranted since the old GETAB value is overly conservative. The excessive conservatism in the GETAB model and inputs is primarily due to the higher [[{3}]] uncertainty [[.{3}]] These limitations are not applicable to the 3D-MONICORE (3DM) monitoring system. The revised power distribution model and reduced uncertainties associated with 3DM 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 [[

{3}]]

Summary

[[{3}]] have been used to compare quantities that impact the calculated SLMCPR value. Based on these comparisons, the conclusion is reached that the Vermont Yankee Cycle 24 core/cycle has a flatter core MCPR distribution [[{3}]] and flatter in-bundle power distributions [[{3}]] than what was used to perform the Cycle 23 SLMCPR evaluation.

Utilizing the same bases used for Cycle 23, the calculated [[{3}]] Monte Carlo SLMCPR for Vermont Yankee Cycle 24 is consistent with what one would expect [[

{3}]] the [[{3}]] SLMCPR value is appropriate.

The reduction in SLMCPR to 1.07 associated with the change in basis to the reduced power distribution uncertainties for Vermont Yankee Cycle 24 is consistent with what one would expect for a change to this basis.

Based on all of the facts, observations and arguments presented above, it is concluded that the calculated SLMCPR value of 1.07 for the Vermont Yankee Cycle 24 core is appropriate. It is reasonable that this value is 0.02 lower than the 1.09 value calculated for the previous cycle.

For SLO the calculated safety limit MCPR for the limiting case is 1.09 as determined by specific calculations for Vermont Yankee Cycle 24.

[[

{3}]]

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 Vermont Yankee Cycle 23 is provided in Figure 1. For comparison the core loading information for Vermont Yankee Cycle 24 is provided in Figure 2. The impact of the fuel loading pattern differences on the calculated SLMCPR is correlated to the values of [[

{3}]]

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

Prepared by:

R. M. Butrovich
Fuel Engineering Services

Verified by:

E. W. Gibbs
Fuel Engineering Services

Table 1

Comparison of the Vermont Yankee Cycle 24 and Cycle 23 SLMCPR

QUANTITY, DESCRIPTION	Vermont Yankee Cycle 23	Vermont Yankee Cycle 24	
Number of Bundles in Core	368	368	368
Limiting Cycle Exposure Point	EOR-1K	EOR-1K	EOR-1K
Cycle Exposure at Limiting Point [MWd/STU]	10425	11150	11150
Reload Fuel Type	GE14	GE14	GE14
Latest Reload Batch Fraction [%]	34.8	31.5	31.5
Latest Reload Average Batch Weight % Enrichment	3.94	3.99	3.99
Batch Fraction for GE14[%]	34.8	66.3	66.3
Batch Fraction for GE13[%]	58.7	28.3	28.3
Batch Fraction for GE9B[%]	6.5	5.4	5.4
Core Average Weight % Enrichment	3.76	3.83	3.83
Core MCPR (for limiting rod pattern)	1.46	1.47	1.47
[[			{3}]]
[[			{3}]]
Power distribution methodology	GETAB NEDO-10958-A	GETAB NEDO-10958-A	Revised NEDC-32601P-A
Power distribution uncertainty	GETAB NEDO-10958-A	GETAB NEDO-10958-A	Reduced NEDC-32694P-A
Non-power distribution uncertainty	Revised NEDC-32601P-A	Revised NEDC-32601P-A	Revised NEDC-32601P-A
Calculated Safety Limit MCPR	**1.09**	[[{3}]]	**1.07**

Table 2
Vermont Yankee Cycles 23 and 24 SLMCPR Results Assessment

1	2	3a	3b	4
Quantity	Cycle 23 GETAB Value	Cycle 24 GETAB Bases	Cycle 24 Revised Bases	Impact on SLMCPR for Cycle 24
Tech Specs	1.09	Used for comparison only	1.07	0.02
1. Impact of Revised Uncertainties Not Related to Power Distribution				
Reference Document	NEDC-32601P-A August 1999	NEDC-32601P-A August 1999	NEDC-32601P-A August 1999	Approved by NRC
Feedwater flow uncertainty	[[		{3}]]	None
Reactor pressure uncertainty	[[		{3}]]	None
Channel flow area uncertainty	[[		{3}]]	None
Friction multiplier uncertainty	[[		{3}]]	None
				[[{3}]]
2. Impact of Reduced Power Distribution Uncertainties and Revised Modeling				
Reference Document	NEDO-10958-A January 1977	NEDO-10958-A January 1977	NEDC-32694P-A August 1999	Both approved by NRC
R-factor uncertainty	[[		{3}]]	[[{3}]]
Critical power uncertainty	[[		{3}]]	None
TIP random uncertainty component	[[[[		{3}]] {3}]]	None
Adaptive mode for Safety Limit analysis	Absolute	Absolute	Shape	Both approved by NRC
Effective total bundle power uncertainty	[[		{3}]]	Part of overall TIPSYS
Effective non-random TIPSYS	[[		{3}]]	Part of overall TIPSYS
Effective overall TIPSYS uncertainty as modeled	[[		{3}]]	[[{3}]]
3. Secondary Impact on SLMCPR because Reduced SLMCPR causes a Lower OLMCPR				
Target OLMCPR	1.46	1.47	1.47	See below
[[			{3}]]	[[{3}]]
[[			{3}]]	[[{3}]]
[[{3}]]				[[{3}]]
Total Impact on SLMCPR				(col. 3b-3a)
Calculated SLMCPR - DLO	[[			{3}]]
Calculated SLMCPR - SLO	[[			{3}]]
TS SLMCPR - DLO	1.09	[[{3}]]	1.07	[[{3}]]
TS SLMCPR - SLO	1.11	[[{3}]]	1.09	[[{3}]]

Figure 1 - Cycle 23 Reference Core Loading Pattern

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1									9	13	12	12	13	9									44
2			Bundle IAT					9	12	16	16	16	16	12	9								42
3					9	12	12	12	19	16	18	18	16	19	12	12	12	9					40
4				13	13	16	16	20	16	18	12	12	18	16	20	16	16	13	13				38
5			9	13	18	16	20	16	18	16	18	18	16	18	16	20	16	18	13	9			36
6			12	16	16	18	12	18	12	18	12	12	18	12	18	12	18	16	16	12			34
7			12	16	20	12	20	16	18	16	19	19	16	18	16	20	12	20	16	12			32
8		9	12	20	16	18	16	18	13	18	17	17	18	13	18	16	18	16	20	12	9		30
9	9	12	19	16	18	12	18	13	18	13	18	18	13	18	13	18	12	18	16	19	12	9	28
10	13	16	16	18	16	18	16	18	13	18	17	17	18	13	18	16	18	16	18	16	16	13	26
11	12	16	18	12	18	12	19	17	18	17	13	13	17	18	17	19	12	18	12	18	16	12	24
12	12	16	18	12	18	12	19	17	18	17	13	13	17	18	17	19	12	18	12	18	16	12	22
13	13	16	16	18	16	18	16	18	13	18	17	17	18	13	18	16	18	16	18	16	16	13	20
14	9	12	19	16	18	12	18	13	18	13	18	18	13	18	13	18	12	18	16	19	12	9	18
15		9	12	20	16	18	16	18	13	18	17	17	18	13	18	16	18	16	20	12	9		16
16			12	16	20	12	20	16	18	16	19	19	16	18	16	20	12	20	16	12			14
17			12	16	16	18	12	18	12	18	12	12	18	12	18	12	18	16	16	12			12
18			9	13	18	16	20	16	18	16	18	18	16	18	16	20	16	18	13	9			10
19				13	13	16	16	20	16	18	12	12	18	16	20	16	16	13	13				08
20					9	12	12	12	19	16	18	18	16	19	12	12	12	9					06
21								9	12	16	16	16	16	12	9								04
22									9	13	12	12	13	9									02
	01	03	05	07	09	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	

Bundle Name	IAT	# in Core	# Fresh	Cycle Loaded
GE9B-P8DWB335-10GZ-80M-150-T	9	24	0	18
GE13-P9HTB380-12GZ-100T-146-T	12	72	0	20
GE13-P9HTB379-13GZ-100T-146-T	13	40	0	20
GE13-P9DTB386-11G4.0/1G3.0-100T-146-T-2425	16	88	0	22
GE13-P9DTB225-NOG-100T-146-T-2570	17	16	0	22B
GE14-P10DNAB394-7G5.0/6G4.0-100T-150-T-2538	18	92	92	23
GE14-P10DNAB394-8G5.0/6G4.0-100T-150-T-2589	19	16	16	23
GE14-P10DNAB394-12G5.0-100T-150-T-2590	20	20	20	23
	Total	368	128	

Figure 2 - Cycle 24 Reference Core Loading Pattern

Bundle IAT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1									7	16	16	16	16	7									44
2								16	18	18	16	16	18	18	16								42
3					8	16	16	16	1	18	1	1	18	1	16	16	16	8					40
4				8	16	18	18	1	20	5	18	18	5	20	1	18	18	16	8				38
5			8	16	2	18	1	18	5	20	5	5	20	5	18	1	18	2	16	8			36
6			16	18	18	2	18	5	18	2	17	17	2	18	5	18	2	18	18	16			34
7			16	18	1	20	5	18	2	19	2	2	19	2	18	5	20	1	18	16			32
8		16	16	1	18	5	18	2	16	16	17	17	16	16	2	18	5	18	1	16	16		30
9	7	18	1	20	5	18	2	16	16	19	2	2	19	16	16	2	18	5	20	1	18	7	28
10	16	18	18	5	20	2	19	16	19	5	18	18	5	19	16	19	2	20	5	18	18	16	26
11	16	16	1	18	5	17	2	17	2	18	16	16	18	2	17	2	17	5	18	1	16	16	24
12	16	16	1	18	5	17	2	17	2	18	16	16	18	2	17	2	17	5	18	1	16	16	22
13	16	18	18	5	20	2	19	16	19	5	18	18	5	19	16	19	2	20	5	18	18	16	20
14	7	18	1	20	5	18	2	16	16	19	2	2	19	16	16	2	18	5	20	1	18	7	18
15		16	16	1	18	5	18	2	16	16	17	17	16	16	2	18	5	18	1	16	16		16
16			16	18	1	20	5	18	2	19	2	2	19	2	18	5	20	1	18	16			14
17			16	18	18	2	18	5	18	2	17	17	2	18	5	18	2	18	18	16			12
18			8	16	2	18	1	18	5	20	5	5	20	5	18	1	18	2	16	8			10
19				8	16	18	18	1	20	5	18	18	5	20	1	18	18	16	8				08
20					8	16	16	16	1	18	1	1	18	1	16	16	16	8					06
21								16	18	18	16	16	18	18	16								04
22									7	16	16	16	16	7									02
	01	03	05	07	09	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	

IAT	Bundle Name	# in Core	# Fresh	Cycle Loaded
1	GE14-P10DNAB426-16G6.0-100T-150-T6-2682	32	32	24
2	GE14-P10DNAB390-14GZ-100T-150-T6-2683	44	44	24
5	GE14-P10DNAB388-17GZ-100T-150-T6-2684	40	40	24
7	GE9B-P8DWB335-10GZ-80U-150-T6	8		17
8	GE9B-P8DWB335-11GZ-80U-150-T6	12		17
16	GE13-P9DTB386-11G4.0/1G3.0-100T-146-T6-3958	88		22
17	GE13-P9DTB225-NOG-100T-146-T6-2571	16		22B
18	GE14-P10DNAB394-7G5.0/6G4.0-100T-150-T6-2566	92		23
19	GE14-P10DNAB394-8G5.0/6G4.0-100T-150-T6-2595	16		23
20	GE14-P10DNAB394-12G5.0-100T-150-T6-2596	20		23
	Total	368	116	

Docket No. 50-271
BVY 03-114

Attachment 5

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 264

GNF Summary of Technical Basis for SLMCPR Values

(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 Vermont Yankee Cycle 24," November 3, 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 5th day of November, 2003.

Margaret E. Harding

Margaret E. Harding
Global Nuclear Fuel – Americas, LLC