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**Michael J. Colomb**
Site Vice President

BVY 09-063

October 27, 2009

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

SUBJECT: Technical Specification Proposed Change No. 287
Safety Limit Minimum Critical Power Ratio (SLMCPR) Change
Vermont Yankee Nuclear Power Station
Docket No. 50-271
License No. DPR-28

Dear Sir or Madam:

Pursuant to 10CFR50.90, Vermont Yankee (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 re-typed Technical Specification pages. Attachment 5 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 10CFR2.390(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 2010 with a 60-day implementation period, to coincide with our refueling outage.

A001
NRR

There are no new commitments being made in this submittal.

If you have any questions concerning this transmittal or require additional information, please contact Mr. David J. Mannai at (802) 451-3304.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on October 27, 2009.

Sincerely,

MJC/JTM

Attachments:

1. Supporting Information and Safety Assessment of Proposed Change
2. Determination of No Significant Hazards Consideration
3. Marked-up Version of the Current Technical Specification Page
4. Re-typed Technical Specification Page
5. GNF Summary of Technical Basis for SLMCPR Values (Proprietary)
6. GNF Summary of Technical Basis for SLMCPR Values (Non-proprietary)

cc: Mr. James S. Kim, Project Manager
Division of Licensing Project Management
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop O-8-C2A
Washington, D.C. 20555

Mr. Samuel J. Collins
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
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USNRC Resident Inspector
Vermont Yankee Nuclear Power Station
320 Governor Hunt Road
Vernon, VT 05354

Mr. David O'Brien, Commissioner (w/o proprietary information)
Vermont Department of Public Service
112 State Street, Drawer 20
Montpelier, VT 05620-2601

**Global Nuclear Fuel – Americas**

**AFFIDAVIT**

**I, Anthony P. Reese,** state as follows:

(1) I am Manager, Reload Design & Analysis, Global Nuclear Fuel–Americas, LLC ("GNF-A"), and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GNF proprietary report, GNF-0000-0100-8106-P, *GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR, Vermont Yankee Cycle 28*, Class III, (GNF Proprietary Information), dated 9/18/2009. The GNF proprietary information in GNF-0000-0100-8106-P is identified by a dotted underline inside double square brackets. [[This sentence is an example.{3}]] A "[[" marking at the beginning of a table, figure, or paragraph closed with a "]]" marking at the end of the table, figure or paragraph is used to indicate that the entire content between the double brackets is proprietary. 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 2.390(a)(4) for "trade secrets" (Exemption 4). The material for which exemption from disclosure is here sought 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 aspects of past, present, or future GNF-A customer-funded development plans and programs, resulting in potential products to GNF-A;

d. 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 10 CFR 2.390 (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. 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. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(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 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 information is part of GNF-A's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical, and NRC review costs comprise a substantial investment of time and money by GNF-A.

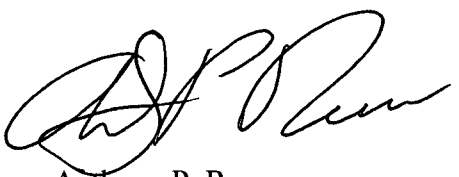
The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GNF-A would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GNF-A of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining these very valuable analytical tools.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 18th day of September 2009.



Anthony P. Reese
Manager, Reload Design & Analysis
Global Nuclear Fuel – Americas, LLC

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Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 287

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 (VY) 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 1.07 (1.09 for single recirculation loop operation) with new values of 1.09 (1.10 for single recirculation loop operation).

**Reason for the Proposed Change**

The current Safety Limit Minimum Critical Power Ratio (SLMCPR) values for dual and single recirculation loop operation contained in the VY Technical Specifications (1.07 and 1.09, respectively) are not applicable for the upcoming operating cycle due to core loading design and fuel type changes. Based upon the core loading and fuel design change, the cycle specific SLMCPR values were determined to be 1.09 for dual recirculation loop and 1.10 for single recirculation loop operation.

**Safety Assessment of Proposed Change**

The purpose of the SLMCPR is to ensure that specified acceptable fuel design limits are not exceeded during steady state operation and analyzed transients. The fuel cladding is one of the physical barriers that separate the radioactive materials from the environment. The integrity of this cladding barrier is related to its relative freedom from perforations or cracking. Fuel cladding perforations can result from thermal stresses, which can occur from reactor operation significantly above design conditions. Since the parameters that result in fuel damage are not directly observable during reactor operation, the thermal and hydraulic conditions that result in the onset of transition boiling have been used to mark the beginning of the region in which fuel cladding damage could occur. Although it is recognized that the onset of transition boiling would not result in damage to the BWR fuel rod cladding, the critical power at which boiling transition is calculated to occur has been adopted as a convenient and conservative limit. However, the uncertainties in monitoring the core operating state and in the procedures used to calculate the critical power, result in an uncertainty in the value of the critical power. Therefore, the SLMCPR is defined as the critical power ratio in the limiting fuel assembly (with margin) for which more than 99.9% of the fuel rods in the core are expected to avoid boiling transition, considering the power distribution within the core and all uncertainties.

The revised SLMCPR for VY was determined using cycle-specific fuel and core parameters, with NRC approved methodology, as discussed in Attachment 5 (GNF Additional Information Regarding the Requested Changes to the Technical Specification SLMCPR) and Attachment 6 (a non-proprietary version of GNF summary). Analysis of the limiting Abnormal Operational Transients (AOT) provides the allowed operating conditions in terms of MCPR, of the core during the fuel cycle such that if an event were to occur, the transient MCPR would not be less than the SLMCPR. The SLMCPR value for single recirculation loop operation is increased to account for increased core flow measurement uncertainties.

No plant hardware or operational changes are required with this proposed change.

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Attachment 2

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 287

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. 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.

   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 has 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. 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.

   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. 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.

The new SLMCPR is calculated using NRC approved methods with plant and cycle specific parameters for the current core design. The SLMCPR value remains conservative 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. 287

Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Marked-up Version of the Current Technical Specification Page

## 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).

1.09

1.10

## 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 Allowable Value (Run Mode)

When the mode switch is in the RUN position, the APRM flux scram Allowable Value shall be:

Two loop operation:

$S \leq 0.33W + 50.45\%$ for $0\% < W \leq 30.9\%$

$S \leq 1.07W + 27.23\%$ for $30.9\% < W \leq 66.7\%$

$S \leq 0.55W + 62.34\%$ for $66.7\% < W \leq 99.0\%$

With a maximum of 117.0% power for $W > 99.0\%$

Single loop operation:

$S \leq 0.33W + 48.00\%$ for $0\% < W \leq 39.1\%$

$S \leq 1.07W + 19.01\%$ for $39.1\% < W \leq 61.7\%$

$S \leq 0.55W + 51.22\%$ for $61.7\% < W \leq 119.4\%$

With a maximum of 117.0% power for $W > 119.4\%$

where:

$S$ = setting in percent of rated thermal power (1912 MWt)

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Attachment 4

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 287

Safety Limit Minimum Critical Power Ratio (SLMCPR) Change

Re-typed Technical Specification Page

## 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 1.09 (1.10 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 Allowable Value (Run Mode)

When the mode switch is in the RUN position, the APRM flux scram Allowable Value shall be:

Two loop operation:

$S \leq 0.33W + 50.45\%$ for $0\% < W \leq 30.9\%$

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$S \leq 0.55W + 62.34\%$ for $66.7\% < W \leq 99.0\%$

With a maximum of 117.0% power for $W > 99.0\%$

Single loop operation:

$S \leq 0.33W + 48.00\%$ for $0\% < W \leq 39.1\%$

$S \leq 1.07W + 19.01\%$ for $39.1\% < W \leq 61.7\%$

$S \leq 0.55W + 51.22\%$ for $61.7\% < W \leq 119.4\%$

With a maximum of 117.0% power for $W > 119.4\%$

where:

S = setting in percent of rated thermal power (1912 MWt)