

William R. Kanda
Vice President - Nuclear440-280-5579
Fax: 440-280-8029April 5, 2004
PY-CEI/NRR-2753LUnited States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555Perry Nuclear Power Plant
Docket No. 50-440
License Amendment Request Pursuant to 10CFR50.90: Revision of the Minimum Critical
Power Ratio Safety Limit

Ladies and Gentlemen:

Nuclear Regulatory Commission (NRC) review and approval of a license amendment for the Perry Nuclear Power Plant (PNPP) is requested. The proposed amendment would modify the existing Minimum Critical Power Ratio (MCPR) Safety Limit contained in Technical Specification 2.1.1.2. Specifically, the change modifies the MCPR Safety Limit values, as calculated by Global Nuclear Fuel (GNF), by decreasing the limit for two recirculation loop operation from 1.10 to 1.08, and decreasing the limit for single recirculation loop operation from 1.11 to 1.10. The change resulted from a core reload analysis performed during the PNPP Fuel Cycle 10.

A similar license amendment request, to revise the MCPR Safety Limit, was made on January 30, 2003 (PNPP letter number PY-CEI/NRR-2665L). This request was under review by the NRC staff when it was withdrawn. The withdrawal was due to the proposed Safety Limit values changing as a result of the aforementioned core reload analysis.

Approval of the license amendment is requested prior to September 1, 2004, with the amendment being implemented within 90 days following its effective date. The current MCPR Safety Limit values are conservative when compared with the proposed values. PNPP will operate under the current MCPR Safety Limit until the proposed change is NRC approved and implemented by the site.

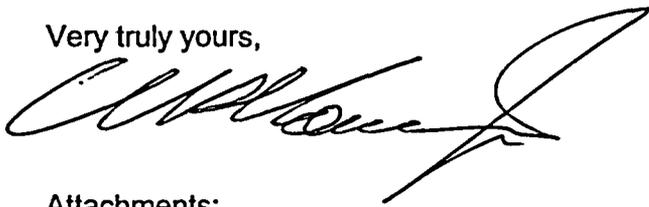
^{5f}
Attachment 6 contains Proprietary
Information as described in
10 CFR 2.790(a)(4). Upon
separation of Attachment 6, this
letter may be decontrolled.

APO1

The GNF report detailing the development of the proposed PNPP MCPR Safety Limit values is attached as both a proprietary and non-proprietary version. GNF considers proprietary information to be controlled pursuant to 10 CFR 2.790(a)(4). Therefore, an affidavit requesting that GNF proprietary information be withheld from disclosure is also attached.

There are no regulatory commitments included in this letter or its attachments. If you have questions or require additional information, please contact Mr. Vernon K. Higaki, Manager - Regulatory Affairs, at (440) 280-5294.

Very truly yours,



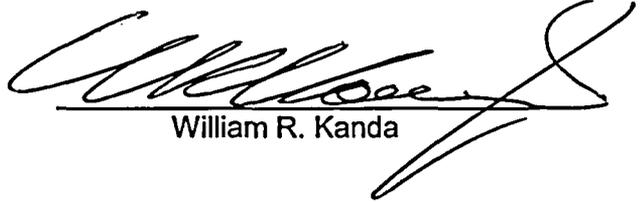
Attachments:

1. Notarized FirstEnergy Nuclear Operating Company Affidavit
2. Description, Background, Technical Analysis, Regulatory Analysis, and Environmental Consideration for the Proposed Technical Specification Change
3. Significant Hazards Consideration
4. Technical Specification Page Annotated with Proposed Change
5. GNF Non-proprietary Report
6. GNF Proprietary Report
7. GNF Affidavit

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III
State of Ohio

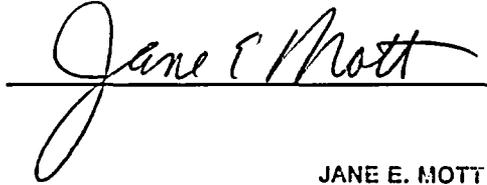
Attachment 6 contains Proprietary Information as described in 10 CFR 2.790(a)(4). Upon separation of Attachment 6, this letter may be decontrolled.

I, William R. Kanda, hereby affirm that (1) I am Vice President - Perry, of the FirstEnergy Nuclear Operating Company, (2) I am duly authorized to execute and file this certification as the duly authorized agent for The Cleveland Electric Illuminating Company, Toledo Edison Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.



William R. Kanda

Subscribed to and affirmed before me, the 6th day of April, 2004



JANE E. MOTT
Notary Public, State of Ohio
My Commission Expires Feb. 20, 2005
(Recorded in Lake County)

1.0 DESCRIPTION

This License Amendment Request proposes to modify the Minimum Critical Power Ratio (MCPR) Safety Limit values contained in Technical Specification (TS) 2.1.1.2, for Fuel Cycle 10. The MCPR Safety Limit value for two recirculation loop operation will be changed from 1.10 to 1.08, and the single recirculation loop operation value will be changed from 1.11 to 1.10. Additionally, the term "Minimum Critical Power Ratio" will be inserted prior to the first use of the acronym, "MCPR."

2.0 PROPOSED TECHNICAL SPECIFICATION CHANGE

Technical Specification 2.1.1, "Reactor Core Safety Limits", will be changed by revising Section 2.1.1.2 to read:

"With the reactor steam dome pressure \geq 785 psig and core flow \geq 10% rated core flow:

The Minimum Critical Power Ratio (MCPR) shall be \geq 1.08 for two recirculation loop operation
or \geq 1.10 for single recirculation loop operation."

The proposed change will be applicable for the duration of Fuel Cycle 10.

3.0 BACKGROUND

The MCPR Safety Limit is one of the limits used to protect the nuclear fuel. 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 (i.e., MCPR = 1.00) have been used to mark the beginning of the region in which fuel damage could occur. Although it is recognized that the onset of transition boiling would not result in damage to Boiling Water Reactor (BWR) fuel rods, the critical power at which boiling transition is calculated to occur has been adopted as a convenient limit. The Safety Limit is defined as the critical power ratio in the limiting fuel assembly 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 various uncertainties. The MCPR Safety Limit provides a 95% probability at the 95% confidence level that following any abnormal operating occurrence, greater than 99.9% of the fuel rods avoid the boiling transition.

4.0 TECHNICAL ANALYSIS

The proposed PNPP MCPR Safety Limit values (proposed to be set at 1.08 for two recirculation loop operation and 1.10 for single recirculation loop operation for PNPP Fuel Cycle 10) were determined using the NRC approved methods detailed in Amendment 25 to NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)", and several other NRC approved General Electric documents, which are incorporated by reference into GESTAR II.

The PNPP-specific evaluation for the Fuel Cycle 10 core reload resulted in different calculated MCPR Safety Limit values because different inputs were used, due to differences in the core design and bundle design used between Fuel Cycles 9 and 10.

The input parameters and the results of the Global Nuclear Fuel – Americas, LLC (GNF) calculations for the PNPP MCPR Safety Limit values are attached. Attachment 5 provides the non-proprietary version of the GNF document. Attachment 6 provides the proprietary version of the GNF document. A GNF affidavit requesting the withholding of disclosure of the proprietary information contained in Attachment 6 is provided in Attachment 7. Attachments 5 and 6 provide maps showing the Reference Loading Pattern for Fuel Cycles 9 and 10 for comparison.

For Fuel Cycle 10, PNPP has changed from using Revision 10 to Revision 11 of the PANACEA Computer Code (including PANACEA's supporting computer codes). PANACEA is a portion of the methodology described within GESTAR II. PANACEA, Revision 11 has been approved by the NRC as detailed in GESTAR II, Amendment 25. Use of PANACEA Revision 11 resulted in a slight change in the fuel type nomenclature listed in the keys to the Reference Loading Pattern Figures for Cycles 9 and 10 contained in Attachments 5 and 6. The changes are to the alpha numeric characters following the number "150." In Cycle 9, the characters subsequent to "150" were either "T" or "T-XXXX." In Cycle 10, the characters subsequent to "150" are either "T6" or "T6-XXXX." The "T6" designator indicates the use of PANACEA, Revision 11.

This change satisfies the fuel and core design requirements described in GESTAR II, as referenced in the PNPP Updated Safety Analysis Report (USAR).

5.0 REGULATORY ANALYSIS

SIGNIFICANT HAZARDS CONSIDERATION

The Significant Hazards Consideration for the proposed Technical Specification change is contained in Attachment 3.

6.0 ENVIRONMENTAL CONSIDERATION

The proposed Technical Specification change request was evaluated against the criteria of 10 CFR 51.22 for environmental considerations. The proposed change does not significantly increase individual or cumulative occupational radiation exposures, does not significantly change the types or significantly increase the amounts of effluents that may be released offsite, and as discussed in Attachment 3, does not involve a significant hazards consideration. Based on the foregoing, it has been concluded that the proposed Technical Specification change meets the criteria given in 10 CFR 51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

SIGNIFICANT HAZARDS CONSIDERATION

The proposed amendment is requesting Nuclear Regulatory Commission review and approval of changes to the Perry Nuclear Power Plant (PNPP) Technical Specifications which revises Technical Specification 2.1.1, "Reactor Core Safety Limits." The proposed changes are the Minimum Critical Power Ratio (MCPR) Safety Limit value for two recirculation loop operation will be reduced from 1.10 to 1.08, and the value for single recirculation loop operation will be reduced from 1.11 to 1.10. Additionally, the term "Minimum Critical Power Ratio" will be inserted prior to the first use of the acronym, "MCPR."

The standards used to arrive at a determination that a request for amendment involves no significant hazards considerations are included in the Nuclear Regulatory Commission's regulation, 10 CFR 50.92, which states that the operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any previously evaluated; or (3) involve a significant reduction in a margin of safety.

The proposed amendment has been reviewed with respect to these three factors, and it has been determined that the proposed change does not involve a significant hazard because:

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

PNPP Updated Safety Analysis Report (USAR) Section 4.2, "Fuel System Design", states the PNPP fuel system design bases are provided in the General Electric Topical Report, NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel (GESTAR II)." The Minimum Critical Power Ratio (MCPR) Safety Limit is one of the limits used to protect the fuel in accordance with the design basis. The MCPR Safety Limit establishes a margin to the onset of transition boiling. The basis of the MCPR Safety Limit remains the same, ensuring that greater than 99.9% of all fuel rods in the core avoid transition boiling. The methodology used to determine the MCPR Safety Limit values is contained within GESTAR II and is NRC approved. The change does not result in any physical plant modifications or physically affect any plant components. As a result, there is no increase in the probability of occurrence of a previously analyzed accident.

The fundamental sequences of accidents and transients have not been altered. The Safety Limit MCPR is established to avoid fuel damage in response to anticipated operational occurrences. Compliance with a MCPR Safety Limit greater than or equal to the calculated value will ensure that less than 0.1% of the fuel rods will experience boiling transition. This in turn ensures fuel damage does not occur following transients due to excessive thermal stresses on the fuel cladding. The MCPR Operating Limits are set higher (i.e., more conservative) than the Safety Limit such that potentially limiting plant transients prevent the MCPR from decreasing

below the MCPR Safety Limit during the transient. Therefore, there is no impact on any of the limiting USAR Appendix 15B transients. The radiological consequences remain the same as previously stated in the USAR. Therefore, the consequences of an accident do not increase over previous evaluations in the USAR.

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

The MCPR Safety Limit basis is preserved, which is to ensure that transition boiling does not occur in at least 99.9% of the fuel rods in the core as a result of the postulated limiting transient. The values are calculated in accordance with GESTAR II. The GESTAR II analyses have been accepted by the NRC. The MCPR Safety Limit is one of the limits established to ensure the fuel is protected in accordance with the design basis. The function, location, operation, and handling of the fuel remain unchanged. No changes in the design of the plant or the method of operating the plant are associated with these revised safety limit values. Therefore, no new or different kind of accident from any previously evaluated is created.

3. The proposed change does not involve a significant reduction in a margin of safety.

This change revises the PNPP MCPR Safety Limit values. The new MCPR Safety Limit values reflect changes due to the Cycle 10 core design, but do not alter the design or function of any plant system, including the fuel. The new MCPR Safety Limit values were calculated using NRC-approved methods described in GESTAR II. The proposed MCPR Safety Limit values continue to satisfy the fuel design safety criteria which ensures that transition boiling does not occur in at least 99.9% of the fuel rods in the core as a result of the postulated limiting transient. Therefore, the proposed values for the MCPR Safety Limit do not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, the requested change does not involve a significant hazards consideration.

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be \leq 23.8% RTP.

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

THE MINIMUM CRITICAL POWER RATIO. → (MCPR) shall be \geq ^{1.08} 1.10 for two recirculation loop operation or \geq ^{1.10} 1.11 for single recirculation loop operation.

2.1.1.3 Reactor vessel water level shall be greater than the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be \leq 1325 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed within 2 hours:

2.2.1 Restore compliance with all SLs; and

2.2.2 Insert all insertable control rods.
