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 RECIP. NAME    RECIPIENT AFFILIATION  
                  Document Control Branch (Document Control Desk)

SUBJECT: Application for amend to license NPF-21 for use of cycle 8  
 reload core, unit 2 w/changes to TS 2.1.2, B 2.0 & 6.9.3.2.  
 Proposed changes do not involve significant hazard or  
 increase in accident probability/consequences.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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February 25, 1992  
G02-92-049

Docket No. 50-397

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

Subject: WNP-2, OPERATING LICENSE NPF-21  
REQUEST FOR AMENDMENT TO TECHNICAL SPECIFICATIONS  
SAFETY LIMIT; THERMAL POWER, HIGH PRESSURE AND HIGH FLOW

- References:
- 1) ANF-524(P)(A), Revision 2 and Supplements 1 and 2, "Advanced Nuclear Fuel Corporation Critical Power Methodology for Boiling Water Reactors" November, 1990
  - 2) Letter, G02-92-048, dated February 25, 1992, GC Sorensen to NRC, "Response to NRC Bulletin No. 90-02; 'Loss of Thermal Margin Caused by Channel Box Bow,' Effect on Cycle 8 Operation"
  - 3) Letter, AC Thadani (NRC) to RA Copeland (ANF), "Acceptance for Referencing of Topical Report ANF-524(P) Revision 2, ANF Critical Power Methodology for Boiling Water Reactors", dated August 8, 1990
  - 4) Letter, AC Thadani (NRC) to RA Copeland (ANF), "Acceptance for Referencing of Topical Report XN-NF-80-19(P), Volume 1, Supplement 3, Advanced Nuclear Fuel Methodology for Boiling Water Reactors; Benchmark Results for the Casmo-3G/Microburn-B Calculation Methodology", dated August 13, 1990

In accordance with the Code of Federal Regulations, Title 10, Parts 50.90 and 2.101, the Supply System hereby requests an amendment to the WNP-2 Technical Specifications. This amendment is being submitted to allow the use of the Cycle 8 reload core in WNP-2. Changes to the following Technical Specifications are being requested:

- 2.1.2 Safety Limits; Thermal Power, High Pressure and High Flow
- B 2.0 Safety Limits and Limiting Safety System Settings
- 6.9.3.2 CORE OPERATING LIMITS REPORT (COLR)

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REQUEST FOR AMENDMENT TO TECHNICAL SPECIFICATIONS  
SAFETY LIMIT; THERMAL POWER, HIGH PRESSURE AND HIGH FLOW

Attachment 1 to this letter is the marked-up Technical Specifications. As a part of the markup, a brief summary justification of the change request is included for clarification. The relevant cycle specific vendor document (Attachment 2) describes in detail the technical analysis performed by the fuel vendor to support the proposed Safety Limit change. Section 6.9.3.2 contains revisions to the titles of topical reports referenced as being used in the development of the WNP-2 COLR. These changes are a result of a name change by the fuel vendor and the completion of the (A) version of the mechanical design report for the 9X9-IX and 9X9-9X fuel designs. These topicals were previously reviewed and approved by the NRC (References 3 and 4). The revision to the list of figures (page xx(a)) is requested to reflect an earlier change to the title of the figure. This letter and its attachments form the basis for the proposed no significant hazards determination.

The minimum margin to the steady state boiling transition condition, is implemented as the Minimum Critical Power Ratio (MCPR) safety limit in the WNP-2 Technical Specifications. Operating margins are defined by establishing a minimum margin to the onset of the boiling transition condition for steady state operation and calculating a limiting transient effects allowance, thereby assuring that the steady state limit is protected during anticipated off-normal limiting conditions. The base criterion used in establishing critical power ratio (CPR) or operating margin limits is that at least 99.9% of the fuel rods in the core will be expected to avoid boiling transition (critical heat flux) during normal operation and anticipated limiting operational occurrences. Assurance that this criterion is met is determined through evaluation of critical heat flux phenomena.

The MCPR safety limit is established through statistical consideration of measurement and calculational uncertainties associated with the thermal hydraulic state of the reactor using design basis radial, axial and local power distributions and the effects of channel box bow. Some of the calculational uncertainties, including those introduced by the critical power correlation, power peaking and core coolant distribution, are fuel related.

The design basis power distribution is made up of components corresponding to representative radial, axial and local peaking factors. These factors are determined through examination of operating data from the previous cycle and predictions of operating conditions during the cycle evaluated for the MCPR safety limit. Available operating data for WNP-2 and the predicted operating conditions for Cycle 8 were evaluated to identify the design basis power distributions for use in the Cycle 8 MCPR safety limit analysis.

A statistical analysis for the number of fuel rods in boiling transition was performed using the methodology described in Reference 1. With 250 Monte Carlo trials it was determined with a confidence level of 95% that for a minimum CPR value of 1.07 with two recirculation loop operation and 1.08 with single loop operation, at least 99.9% of the fuel rods in the WNP-2 core would be expected to avoid boiling transition (Attachment 2).



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The effects of channel box bow are included in the MCPR safety limit. Without channel box bow, the MCPR safety limit would be 0.02 lower. The Supply System has reused channel boxes on fuel assemblies in the WNP-2 Cycle 8 core design. The exposure related effects of the reused channel boxes on channel box bow were considered in the Siemens Nuclear Power Corporation (SNP) MCPR safety limit analysis.

The revisions to the Bases Section B 2.0 reflect the analysis performed to support the proposed safety limit change. There is also a change to the ANFB additive constant uncertainties for the 9X9-9X fuel, shown in Bases Table 2.1.2-2. Although the determination of the 0.008 uncertainty for the ANFB additive constant for the 9X9-9X was performed consistent with the method used for the 8X8 and the 9X9-2 fuel, the value of 0.0200 was used for Cycle 8 for the 9X9-9X fuel. The Supply System expects to use the value of 0.008 in future reload cycles for the 9X9-9X fuel. It is included in this Technical Specification amendment request for administrative convenience.

The Supply System has evaluated this request per 10 CFR 50.92 and determined that it does not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

A multidiscipline thermal hydraulic and statistical analysis has been performed for the Cycle 8 reload core (Attachment 2). This analysis considered all of the design changes associated with Cycle 8 and their operational impact. The MCPR safety limit for a given core design is established through statistical analysis of uncertainties associated with the thermal hydraulic state of the core. The MCPR safety limit as developed for the Cycle 8 design assures that at least 99.9% of the fuel rods in the core will avoid boiling transition during normal and anticipated operational occurrences. The proposed change in safety limit provides assurance that the above criterion will be met. With this assurance, it is evident that the probability or consequences of accidents previously analyzed will not change.

2. Create the possibility of a new or different kind of accident from any previously evaluated.

The Cycle 8 reload design has been analyzed in detail (Attachment 2). The change in the MCPR safety limit did not create a new type of accident. The reload design itself is sufficiently similar to the present design to preclude the introduction of a new transient.

3. Create a significant reduction in the margin of safety.

The purpose in the proposed change is to preserve the present margin to safety while providing increased operating margin for the plant. The decreased MCPR safety limit is justified in the cycle specific analysis (Attachment 2) by changes in radial power distribution brought about by the Cycle 8 design. Therefore, the proposed change in MCPR safety limit does not create a reduction in the margin of safety.

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As discussed above, the Supply System considers that this change does not involve a significant hazard consideration, nor is there a potential for sufficient change in the types, or significant increase in the amount of any effluents that may be released offsite, nor does it involve a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and therefore, per 10 CFR 51.22(b), an environmental assessment of the change is not required.

This Technical Specification change has been reviewed and approved by the WNP-2 Plant Operations Committee (POC) and the Supply System Corporate Nuclear Safety Review Board (CNSRB).

WNP-2 is currently scheduled to begin the spring outage on April 10, 1992 and resume operation on June 29, 1992.

Sincerely,



G. C. Sorensen, Manager  
Regulatory Programs (Mail Drop 280)

BMM/bk

Attachments:        1)     Proposed Technical Specification Changes  
                         2)     MCPR Safety Limit, Appendix A

cc:    JB Martin - NRC RV  
         NS Reynolds - Winston & Strawn  
         PL Eng - NRC  
         DL Williams - BPA/399  
         NRC Site Inspector - 901A  
         RG Waldo - EFSEC



STATE OF WASHINGTON

COUNTY OF BENTON

) Subject: Amendment Request Safety Limit;  
) Thermal Power, High Pressure and  
) High Flow

I, G. C. SORENSEN, being duly sworn, subscribe to and say that I am the Manager, Regulatory Programs, for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

DATE: 25 February, 1992

G. C. Sorensen  
G. C. Sorensen, Manager  
Regulatory Programs

On this date personally appeared before me G. C. SORENSEN, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 25<sup>th</sup> day of February 1992.

Leilani Gallagher  
Notary Public in and for the  
STATE OF WASHINGTON

My Commission Expires April 29, 1995

