WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

February 28, 1991
G02-91-040

Docket No. 50-397

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

Gentlemen:

Subject: **NUCLEAR PLANT NO. 2, OPERATING LICENSE NPF-21
REQUEST FOR AMENDMENT TO TECHNICAL SPECIFICATIONS SAFETY LIMIT;
THERMAL POWER, HIGH PRESSURE AND HIGH FLOW**

Reference: Letter, May 3, 1990, RA Copeland (ANF) to RC Jones (USNRC), "Transmittal of Additional Information on Topical Report ANF-524(P), Revision 2"

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 Cycle 7 reload fuel in WNP-2. Changes to the following Technical Specifications are being requested.

2.1.2	Safety Limits; Thermal Power, High Pressure and High Flow
B2.0	Safety Limits and Limiting Safety System Settings

Attached to this letter are marked-up Technical Specifications (Attachment 1) and Appendix A of the relevant cycle specific document (Attachment 2)generated by the fuel vendor. As a part of the markup and in keeping with past Supply System practice, a brief summary justification of the change requests is attached for clarification and information. Taken together, this letter and its attachments form the basis for the proposed no significant hazards determination.

Bundle power limits in a boiling water reactor (BWR) are determined through evaluation of critical heat flux phenomena. The basic criterion used in establishing critical power ratio (CPR) 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 operational occurrences. Operating margins are defined by establishing a minimum margin to the onset of boiling transition condition for steady state operation and calculating a transient effects allowance, thereby assuring that the steady state limit is protected during anticipated off-normal conditions. This letter addresses establishment of the minimum margin to the steady state boiling transition condition, which is implemented as the MCPR safety limit in the plant Technical Specifications.

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 considering fuel assembly channel bow. Some of the calculational uncertainties, including those introduced by the critical power correlation, power peaking, and core coolant distribution, are fuel related. When ANF fuel is introduced into a core where it will reside with another supplier's fuel types, the appropriate value of the MCPR safety limit is calculated based on fuel-dependent parameters associated with the mixed core. Similarly, when an ANF-fabricated reload batch is used to replace a group of dissimilar fuel assemblies, the core average fuel dependent parameters change because of the difference in the relative number of each type of bundle in the core, and the MCPR safety limit is again reevaluated.

The design basis power distribution is made up of components corresponding to representative radial, axial, and local peaking factors. Where such data are appropriately available from the previous cycle, these factors are determined through examination of operating data for the previous cycle and predictions of operating conditions during the cycle being evaluated for the MCPR safety limit. Available operating data for WNP-2 and the predicted operating conditions for Cycle 7 were evaluated to identify the design basis power distributions for use in the Cycle 7 MCPR safety limit analysis.

A statistical analysis for the number of fuel rods in boiling transition was performed using the methodology described in ANF topical report XN-NF-524(P)(A), Revision 2 and Supplements, "Exxon Nuclear Critical Power Methodology for Boiling Water Reactors." With 500 Monte Carlo trials it was determined that for a minimum CPR value of 1.07 up to 4500 MWD/MTU cycle exposure and 1.11 from 4500 MWD/MTU cycle exposure to end of cycle, at least 99.9% of the fuel rods in the core would be expected to avoid boiling transition with a confidence level of 95%. Therefore, the MCPR safety limits proposed are 1.07 for a cycle exposure up to 4500 MWD/MTU and 1.11 for a cycle exposure greater than 4500 MWD/MTU to EOC.

The effects of channel bow are included in the safety limit MCPR (SLMCPR). Without channel bow, the SLMCPR would have been 0.03 lower. The Supply System has reused some initial core channels on fuel assemblies in the WNP-2 Cycle 7 core. The exposure effects of the reused channel on channel bow was considered in the ANF safety limit MCPR analysis. The ANF channel data base used in this analysis includes data that corresponds to a channel exposure of approximately 50,000 MWD/MTU (Reference).

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 consequence of an accident previously evaluated.

   A multidiscipline analysis has been performed for the Cycle 7 reload design. This analysis examines all of the core design changes and their operational impact. The SLMCPR is established through statistical consideration of measurement and calculational uncertainties associated with the thermal hydraulic state of the reactor. The SLMCPR as developed determines that at least 99.9% of the fuel rods in the core will be expected to avoid boiling transition during normal and anticipated operational occurrences. The proposed change in safety limit, analyzed based upon changing core conditions, provides renewed assurance that the above criterion will be met. Because the above criterion has not changed, establishment of the proposed safety limit change will assure 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 7 reload design has been analyzed in some detail. The identification of the need for a change to the SLMCPR does not create a new type of accident. The reload design itself is sufficiently similar to the present design, even considering the fuel design changes, to preclude the introduction of a new transient.

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

   The proposed change to the SLMCPR does not create a reduction in the margin of safety. The purpose of the proposed increase in SLMCPR is to at least preserve the current margin to safety. Changes in analytical methodology, which because of flatter power distributions increases the population of fuel rods potentially near boiling transition, and direct consideration of potential channel bow associated with extended life fuel channels have identified an increase in SLMCPR. The proposed SLMCPR increase has been shown to maintain the current margin of safety enjoyed by the WNP-2 core.

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 12, 1991 and resume operation on or about June 1, 1991.

Very truly yours,

GC Sorensen

G. C. Sorensen, Manager
Regulatory Programs

WCW/bw

Attachments: I. Proposed Technical Specification Changes for Safety Limit, Thermal Power, High Pressure and High Flow
II. ANF-91-01, 2/91, WNP-2 Cycle 7 Plant Transient Analysis, Appendix A

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

STATE OF WASHINGTON)
)
COUNTY OF BENTON)

Subject: REQUEST FOR AMENDMENT T.S. 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: 28 FEB, 1991

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 28th day of February 1991.

Bernie Kasko

Notary Public in and for the
STATE OF WASHINGTON

Residing at Kennewick, WA

My Commission Expires 4/28/94