September 27, 1999

Mr. J. V. Parrish
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: WNP-2- ISSUANCE OF AMENDMENT RE: MINIMUM CRITICAL POWER SAFETY LIMITS (TAC NO. MA5212)

Dear Mr. Parrish:

The Commission has issued the enclosed Amendment No. 158 to Facility Operating License No. NPF-21 for WNP-2. The amendment consists of changes to the Technical Specifications (TS) in response to your application dated April 7, 1999, as supplemented by letters dated May 25, June 21, August 2, and August 30, 1999.

The amendment revises the minimum critical power ratio safety limits.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Original Signed By

Jack Cushing, Project Manager, Section 2
Project Directorate IV & Decomissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-397

Enclosures: 1. Amendment No.158 to NPF-2
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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Sincerely,

J Cushing

Jack Cushing, Project Manager, Section 2
Project Directorate IV & Decomissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-397

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cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENERGY NORTHWEST

DOCKET NO. 50-397

WNP-2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 158
License No. NPF-21

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Energy Northwest (licensee) dated April 7, 1999, as supplemented by letters dated May 25, June 21, August 2, and August 30, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. NPF-21 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No.158 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. The license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Stephen Dembek, Chief, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: September 27, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 158

FACILITY OPERATING LICENSE NO. NPF-21

DOCKET NO. 50-397

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

REMOVE	INSERT
2.0-1	2.0-1
5.0-21	5.0-21

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 ≤ 25% RTP.

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

The MCPR for ATRIUM-9X fuel shall be ≥ 1.10 for two recirculation loop operation or ≥ 1.11 for single recirculation loop operation. The MCPR for the ABB SVEA-96 fuel shall be ≥ 1.10 for two recirculation loop operation or ≥ 1.12 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 ≤ 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.

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

1. ANF-1125(P)(A), and Supplements 1 and 2, "ANFB Critical Power Correlation," April 1990;

2. ANF-NF-524(P)(A), Revision 2 and Supplements 1 and 2, "Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors," November 1990;

3. ANF-89-014(P)(A), Revision 1 and Supplements 1 and 2, "Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advanced Nuclear Fuels Corporation 9x9-IX and 9x9-9X BWR Reload Fuel," October 1991;

4. XN-NF-81-22(P)(A), "Generic Statistical Uncertainty Analysis Methodology," November 1983;

5. NEDE-23785-1-PA, Revision 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident, Volume III, SAFER/GESTR Application Methodology," October 1984;

6. NEDO-20566A, "General Electric Company Analytical Model for Loss-of-Coolant Analysis in Accordance with 10 CFR 50, Appendix K," September 1986;

7. CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel," July 1996; and

8. WPPSS-FTS-131(A), Revision 1, "Applications Topical Report for BWR Design and Analysis," March 1996.

9. ANFB Critical Power Correlation Uncertainty for Limited Data Sets, ANF-1125(P)(A), Supplement 1, Appendix D, Siemens Power Corporation - Nuclear Division, July 1998.

c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.

d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

(continued)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 158 TO FACILITY OPERATING LICENSE NO. NPF-21

ENERGY NORTHWEST

WNP-2

DOCKET NO. 50-397

1.0 INTRODUCTION

By application dated April 7, 1999, as supplemented by letters dated May 25, June 21, August 2 and August 30, 1999, Energy Northwest (the licensee formerly known as Washington Public Power Supply System) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-21) for WNP-2. The proposed changes include the minimum critical power (MCPR) safety limit for Asea Brown Boveri (ABB) SVEA-96 fuel which is coresident with Siemans Power Corporation (SPC) ATRIUM-9X fuel. The WNP-2 Cycle 15 core has 764 fuel assemblies, which consists of 240 unirradiated SVEA-96 assemblies, 348 irradiated SVEA-96 assemblies and 176 irradiated ATRIUM -9X assemblies.

The supplemental letters dated May 25, June 21, August 2 and August 30, 1999, provided clarifying information, did not expand the scope of the application as originally noticed and did not change the staff's original proposed no significant hazards consideration determination published in the Federal Register on May 19, 1999 (64 FR 27329).

2.0 BACKGROUND

Criterion 10 of Appendix A of 10 CFR Part 50, "Reactor Design," (GDC-10) requires, and safety limits ensure, that specified acceptable fuel design limits are not exceeded during steady state operation, normal operational transients, and anticipated operational occurrences. Safety limits are required to be included in the technical specifications by 10 CFR 50.36. Safety limits are established to protect the integrity of the fuel cladding, reactor pressure vessel, and primary system piping during normal plant operations and anticipated transients. The fuel cladding integrity safety limit is the safety limit minimum critical power ratio (MCPR). The basis for the MCPR safety limit is to ensure that greater than 99.9 percent of all fuel rods in the core avoid transition boiling. The margin between calculated boiling transition and the MCPR safety limit is based on a detailed statistical methodology. Every refueling cycle the MCPR is recalculated due to fuel replacement.

3.0 EVALUATION

The following changes are proposed for TS 2.1.1.2, Reactor Core Safety Limit (MCPR):

(1) The MCPR for ATRIUM-9X fuel: "1.13" is changed to "1.10" for two recirculating loop operation, and "1.14" is changed to "1.11" for single recirculating loop operation.

(2) The MCPR for the A.B. SEA-96 fuel: "1.07" is changed to "1.10" for two recirculating loop operation and "1.09" is changed to "1.12" for single recirculating loop operation.

(3) The following sentence is deleted: "The MCPR limits for the ATRIUM 9X fuel are applicable to Cycle 14."

The proposed change to TS 5.6.5, "Core Operating Limits Report," is to add reference 9, "ANFB Critical Power Correlation for Limited Data Sets, ANF-1125(P)(A), Supplement 1, Appendix D, Siemans Power Corporation - Nuclear Division, July 1998," to the list of references.

The WNP-2 Cycle 15 MCPR safety limits were calculated using the ABB BWR reload methodology described in CENPD-300-PA, "Reference Safety Report for Boiling Water Reactor Reload Fuel", July 1996, for the ABB fuel. The Siemens reload methodology, ANF-1125(P)(A), Supplement 1, "ANFB Critical Power Correlation for Limited Data Sets, Appendix D, Siemans Power Corporation - Nuclear Division, July 1998," was used for the Siemens fuel. The staff approved the above reports describing the methodology for implementation of cycle-specific MCPR safety limits. The staff's May 24, 1996, safety evaluation report (SER) for CENPD-300-PA identified several limitations and restrictions to the use of the methodologies. In their letter of June 21, 1999, the licensee confirmed that they comply with all the restrictions and limitations as described below:

(1) "Acceptability of this topical report is subject to review findings of the other relevant topical reports cited in the topical report, and all conditions set forth therein are applicable to this topical report. Furthermore, acceptability of reload analysis is subject to conditions cited in the methodology topical reports."

The complete reload licensing methodology described in CENPD-300-P-A refers to other licensing topical reports which have been accepted by the staff. The licensee reviewed the conditions in these topical reports for the Cycle 15 cycle specific applications of the generic methodology in CENPD-300-P-A to confirm that the conditions of the NRC acceptance of those topical reports have been met, and in their June 21, 1999, letter, the licensee stated that all conditions had been complied with.

(2) "ABB/CE's uncertainty analysis approach is not generically acceptable since the acceptability is highly application dependent. The operating limit MCPR must be calculated with Method A."

The licensee used Method A for Cycle 15 transient analysis establishing the operating limit MCPR.

(3) "The use of ANS79 decay heat curve is not acceptable for loss-of-coolant accident (LOCA) analysis. For compliance with Appendix K, ABB/CE must use 1.2 times the ANS71 as stated in the current 10 CFR Part 50, Appendix K."

The LOCA methodology used to support WNP-2 Cycle 15 reload applications is in compliance with the 10 CFR Part 50, Appendix K assumption of using 1.2 times the ANS 71 decay heat curve.

(4) "No evaluation of validity of sample analyses was performed. Furthermore, the approval recommended in this report does not imply any endorsement of analyses nor of the quantified uncertainties set forth in Appendix D. Therefore, no reference should be made to Appendix D as demonstration in support of any future reload."

None of the results in Appendix D of CENPD-300-P-A were assumed by the licensee to be approved by the NRC, and they were not used to establish cycle-specific limits.

(5) "At the minimum, each reload safety evaluation report should contain all the items referred to in Appendix B of the topical report."

The licensee's WNP-2 Cycle 15 Reference Core Reload Design Report dated January 1999 appropriately addresses the required items.

(6) "ABB/CE must use 110 percent of vessel design pressure for the peak reactor vessel pressure limit unless otherwise governed by a plant specific licensing basis."

In the Cycle 15 licensing analysis, 110 percent of vessel design pressure is used for the peak reactor vessel pressure limit.

(7) "The ABB/CE methodology for determining the operating limit maximum critical power ratio (OLMCPR) for non-ABB/CE fuel as described in CENPD-300P and additional submittals References (1,2,3,4 and 5) is acceptable only when each license application of the methodology identifies the value of the conservative adder to the OLMCPR. The correlation applied to the experimental data to determine the value of the adder must be shown to meet the 95/95 statistical criteria. In addition, the licensee's submittal must include the justification for the adder and reference the appropriate supporting documentation."

A multiplier of 0.975, equivalent to the "conservative adder" is applied to the delta CPR calculation for the SPC 9x9-9x fuel and the supporting documentation reference is given in the licensee's letter of June 21, 1999.

(8) "For the rotated fuel assembly analysis ABB/CE stated its intent to vary gap sizes to reduce conservatism in the analysis accompanied by uncertainty analyses to establish the impact. Since the acceptability of this approach depends upon the validity of the uncertainty analysis, which has not been validated this approach is not acceptable."

A constant gap size instead of varying gap sizes is used in the rotated fuel analysis.

The staff has reviewed the proposed TS 2.1.1.2 changes and the licensee's supplemental letters that were in response to the staff request for additional information (RAI) in the areas of the methodologies used for calculating the SLMCPR values that resulted in a decrease for Siemens ATRIUM-9X fuel and an increase for ABB SVEA-96 fuel for Cycle 15 operation. The staff has found that the proposed TS 2.1.1.2 changes are acceptable based on the following:

(1) the approved methodologies were used to calculate the SLMCPR values for Cycle 15 and they were used in compliance with the specified limitations and restrictions, as stated above;

(2) the decrease of the SLMCPR values for ATRIUM-9X is due to using the new approved additive constant uncertainty (0.0201) in accordance with Reference 6;

(3) the increase in the SLMCPR values for SVEA-96 fuel is due to using a conservative average 0.4 mm channel bow in the analysis; the applicability of the 0.4 mm channel bow is justified based on the ATRIUM-9X test data to the SVEA-96 fuel (Reference 3); and

(4) the changes in MCPR safety limits continue to ensure that the specified fuel design limits are not to be exceeded during normal operation including anticipated operational occurrences as required by GDC 10 and 10 CFR 50.36.

The staff finds it acceptable to delete the following sentence from TS 2.1.1.2, "The CPR limits for the ATRIUM 9X fuel are applicable to Cycle 14.", since the condition statement is not applicable to the Cycle 15 operation.

The staff finds adding reference 9, "ANFB Critical Power Correlation for Limited Data Sets, ANF-1125(P)(A), Supplement 1, Appendix D, Siemans Power Corporation - Nuclear Division, July 1998," to the list of references in TS 5.6.5, "Core Operating Limits Report," acceptable based on the requirement of TS 5.6.5, that "The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents." Reference 9 is one of those documents.

References

1. Letter (G02-99-064) from G. O. Smith to USNRC, "WNP-2 Operating License NPF-21 Request for Amendment, Minimum Critical Power Ratio Safety Limits," April 7, 1999.

2. Letter (G02-99-149) from D. W. Coleman to USNRC, "WNP-2 Operating License NPF-21 Request for Amendment, Minimum Critical Power Ratio Safety Limits (Supplemental Information)," August 2, 1999.

3. Letter (G02-99-164) from D. W. Coleman to USNRC, "WNP-2 Operating License NPF-21 Request for Amendment, Minimum Critical Power Ratio Safety Limits (Additional Information - Channel Bow)," August 30, 1999.

4. CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel," July 1996.

5. WNP-2 Cycle 15 Reference Core Reload Design Report, January 1999.

6. ANFB Critical Power Correlation Uncertainty for Limited Data Sets, AN-1125 (P)(A), Supplement 1, Appendix D, Siemens Power Corporation, Nuclear Division, July 1998.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Washington State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (64 FR 27329). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: G. Thomas
T. Huang

Date: September 27, 1999