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SUBJECT: Responds to request for info re 930709 submittal to increase WNP-2 licensed power level.

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May 3, 1994
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Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21**
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION, POWER UPRATE REVIEW (TAC M87076)

Reference: Letter, dated January 26, 1994, JW Clifford (NRC) to JV Parrish (SS), "Request for Additional Information, Power Uprate Review (TAC No. M87076)

The Attachment provides the Supply System response to the request for additional information included with the reference, related to our July 9, 1993 submittal to increase the WNP-2 licensed power level.

Should you have any questions or desire additional information regarding this matter, please call me or H. E. Kook at (509) 377-4278.

Sincerely,

J. V. Parrish (Mail Drop 1023)
Assistant Managing Director, Operations

WCW/bk
Attachment

cc: LJ Callan - NRC RIV
KE Perkins, Jr. - NRC RIV, Walnut Creek Field Office
NS Reynolds - Winston & Strawn
JW Clifford - NRC
DL Williams - BPA/399
NRC Sr. Resident Inspector - 927N

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ATTACHMENT

QUESTION

Power Uprate Section 6.3 FUEL POOL COOLING AND CLEANUP SYSTEM (FPCCS)

Section 9.1.3.2.1 of the WNP-2 FSAR states that the FPCCS can maintain the fuel pool less than 155°F assuming a normal heat load (presented in Table 9.1-3 of the FSAR), a maximum heat exchanger cooling water temperature of 95°F, and having only one FPCCS pump and heat exchanger in operation. How does the proposed power uprate affect the capability of the FPCCS to cool the fuel pool under the conditions described in the FSAR?

RESPONSE

A fuel pool cooling case having only one Fuel Pool Cooling and Cleanup System (FPCCS) Loop available was analyzed as part of the Power Uprate Program. This case conservatively assumes (1) a two year fuel cycle, (2) a core thermal power level of 3629 MWt and (3) normal refueling. To maintain the same basis as the containment analysis in NEDC-32141P, FPCCS heat exchanger cooling water temperature of 90°F was used. The WNP-2 maximum service water temperature based on a bounding calculation, including the impact of power uprate conditions, is no higher than 88.7°F, thus the 90°F is conservative for this analysis. The resulting calculated maximum fuel pool temperature is less than 155°F, which satisfies the provisions of FSAR Section 9.1.3.2.1.

QUESTION

Power Uprate Section 6.4.3 REACTOR BUILDING CLOSED COOLING WATER SYSTEM (RBCCW)

The WNP-2 FSAR states that the RBCCW system contains three half-capacity heat exchangers based on the maximum normal cooling requirements. Describe in detail the heat load under the maximum normal cooling conditions, and what effect the increase from the FPCCS heat exchangers, the RWCU non-regenerative heat exchangers, and the drywell air coolers will have on the RBCCW heat exchanger capacity.

RESPONSE

The method used to analyze the adequacy of the Reactor Building Closed Cooling Water (RBCCW) System to operate and effectively remove heat from equipment operating under power uprate conditions is as follows:

The RBCCW design capacity was compared to the capacity necessary to support power uprate operation. For the determination of the maximum normal cooling requirements, the analysis accounted for the higher heat loads due to power uprate operating conditions for the drywell coolers, fuel pool heat exchangers and non-regenerative heat exchangers. These heat exchangers represent the higher heat loads on the RBCCW System. Due to the higher downcomer temperature resulting from the power uprate conditions (<2°F), the heat removal rate for the non-regenerative heat exchangers is increased. This corresponds to an increase in the heat load of the non-regenerative heat exchangers of approximately 110,000 Btu/hr. Additionally, the drywell air cooling loads increase by .4% from the pre-uprate heat loads. The fuel pool cooling heat exchanger loads are also increased as the result of power uprate. All other heat exchanger loads were maintained as originally designed since they were not affected by operation at power uprate conditions. Finally, as compared to the original design heat loads depicted in the WNP-2 FSAR, this analysis excluded the original design heat load (approximately 7 MBtu/hr) of the decontamination concentrator condensers as they are no longer part of the WNP-2 design bases.

The overall results of the heat loads indicate that the RBCCW System heat load at power uprate conditions will be approximately 46.5 MBtu/hr which is below the design capacity of 50.0 MBtu/hr. Thus, it is concluded that the RBCCW System has adequate design capacity with suitable margin for uprated power operation with maximum normal cooling requirements.

QUESTION

Power Uprate Section 6.4.4 ULTIMATE HEAT SINK (UHS)

In the analysis of the UHS, reference is made to a reactor decay heat model that is more refined than the one used to conduct the original analysis in the FSAR, resulting in a nominal decrease in the spray pond temperature following a DBA-LOCA. Has the new decay heat model been accepted by the NRC for its use in this analysis? If it has not, justify your use of the model for this analysis.

RESPONSE

This is the initial application of the new decay heat model for WNP-2. The new decay heat model has not been accepted by the NRC for its use in this analysis for WNP-2. The long term containment pressure and temperature response to the Loss-of-Coolant Accident (LOCA) for WNP-2 was performed utilizing the ANSI/ANS 5.1-1979 decay heat model. This is consistent with the intent of NEDO-31897 and NEDO-31897P-A, Appendix G (Reference 1). The containment analysis was performed with conservative input assumptions for the design basis accident evaluation. The generated heat load due to LOCA is transferred to the suppression pool and on to the RHR heat exchangers and eventually is dissipated by the Ultimate Heat Sink

(UHS). For the UHS analysis, the ANSI/ANS 5.1-1979 decay heat model was also used to study the impact of power uprate. This ensures that a consistent set of models (e.g., decay heat model) are used from the reactor vessel on to the UHS. The result of the analysis indicates that the post-LOCA temperature in the UHS is slightly lower than that of the original FSAR value. This is due to the lower integrated heat addition from using the ANSI/ANS 5.1-1979 decay heat model as compared to the original decay heat model used in the current FSAR analysis.

Independent of the above analysis, an analysis was performed using the decay heat model referenced in the WNP-2 FSAR. The result of this analysis indicates that the predicted UHS evaporation rate increases by 3% to 4% as compared with the original FSAR. However, this does not affect the minimum required inventory of the UHS System. Use of the ANSI/ANS 5.1-1979 decay heat model with conservative inputs is justified because it provides an adequately conservative basis for the UHS analysis for WNP-2 when compared to the current decay heat model under uprate conditions and is consistent with all upstream analyses (e.g., containment and nominal ECCS-LOCA analyses).

REFERENCES

1. GE Nuclear Energy, "Generic Guidelines for General Electric Boiling Water Reactor Power Uprate," Licensing Topical Report NEDO-31897, Class I (Non-Proprietary), February 1992; and NEDC-31897P-A, Class III (Proprietary), May 1992.

QUESTION

Power Uprate Section 6.6 POWER DEPENDENT HVAC

Section 6.6 of the power uprate submittal states that some Turbine Building (TB) space temperatures may exceed their design by as much as 5°F as a result of the power uprate. It is further stated that these temperatures will not significantly affect the environment in the TB. Provide assurance that equipment in the spaces exposed to temperatures exceeding design temperature will not be "significantly" affected.

RESPONSE

The room temperatures for the Turbine Building (TB) were calculated using the heat rejection loads at power uprate conditions with an additional 10 percent margin. The results of the evaluations indicate that three areas of the TB are most affected by uprated operation: space temperature in the piping chase above the corridor on elevation 441'-0", the condenser areas on elevation 441'-0" and 471'-0" and the feedwater heater area on elevation 471'-0." These areas are increased in temperature by less than 2°F. This is due to the higher temperatures (≤ 5°F) as the result of power uprate conditions in the process fluids. These higher temperatures are found mainly in the feedwater heaters and piping, the condenser and its associated piping.

ATTACHMENT

The three areas noted above currently experience temperatures between .8 and 4.4°F above the design temperature for the specific areas. Design temperatures range from 110 to 120°F. Power uprate conditions will increase the temperatures in these areas by .7 to 1.7°F. There is no safety related equipment in these areas for which the equipment design capability is exceeded due to this small increase. The Turbine Building Ventilation System is a non-safety related system. There is no impact on the capacity of the ventilation equipment serving the Turbine Building due to uprate conditions.