NMC
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Palisades Nuclear Plant
Operated by Nuclear Management Company, LLC

December 10, 2003 10 CFR 50.90

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

License Amendment Request: Thermal Margin/Low Pressure Trip – Response To Request For Additional Information (TAC NO. MB7791)

By letter dated October 17, 2002, Nuclear Management Company, LLC (NMC), requested Nuclear Regulatory Commission (NRC) review and approval of a license amendment for the Palisades Nuclear Plant. NMC proposed to revise Table 3.3.1-2 of Appendix A, Technical Specifications, to modify a constant in the variable Thermal Margin/Low Pressure (TM/LP) trip equation.

The NRC has requested NMC provide additional information recently discussed during telephone conversations. Attached is NMC's response to the requested information.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments:

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 10, 2003.

Daniel J. Malone
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Nuclear Management Company, LLC

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A001

Enclosure (1)

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE 1
ADDITIONAL INFORMATION FOR THERMAL MARGIN/LOW PRESSURE TRIP LICENSE AMENDMENT REQUEST

The following Nuclear Regulatory Commission (NRC) questions were discussed with the Nuclear Management Company, LLC (NMC) during recent telephone conversations.

NRC Question #1
Describe the use of method 3 for determining setpoint allowable values as described in ISA-RP67.04-2000, "Methodologies For The Determination of Setpoints for Nuclear Safety-Related Instrumentation," with respect to the Thermal Margin/Low Pressure (TM/LP) uncertainty analysis by the Nuclear Management Company, LLC (NMC) for the Palisades Nuclear Plant.

NMC Response
Although NMC generally performs setpoint calculations using method 3 to determine allowable values for Palisades, this method was not used explicitly in the TM/LP trip uncertainty analysis, EA-ELEC08-0005, "Uncertainty Calculation for the Thermal Margin Low Pressure (TM/LP) Trip Function Provided by Calculators PY-0102A, PY-0102B, PY-0102C, and PY-0102D." This uncertainty analysis is attached to the October 17, 2002 license amendment request currently being reviewed by the NRC staff. For the TM/LP trip only, the setpoint and allowable value are one and the same. This is due to the setpoint being provided within a digital device. As such the setpoint is not subject to inaccuracy or drift. As the trip setpoint and allowable value are the same, no allowable value calculation using method 3 or any other Instrument Society of America (ISA) method was required to be performed.

EA-ELEC08-0005 determines the total loop uncertainty associated with the instrumentation supplying signals to the Thermal Margin Monitors (TMMs). The total loop uncertainty was determined using the ISA methodology for determining and combining instrument errors. This loop uncertainty is then combined with other neutronic and core uncertainties by the fuel vendor to verify the acceptability of the setpoint.

The TM/LP trip, which is unique to Combustion Engineering Nuclear Steam Supply System plants, is provided to protect against slow heatup and depressurization events. In order to perform this function, the TM/LP trip initiates prior to exceeding acceptable fuel design limits associated with departure from nucleate boiling (DNB) or prior to the average core exit temperature reaching saturation conditions. Unlike other trip initiating parameters, which have a single well defined analytical limit, DNB is a complex function of many core variables. Therefore, it is not possible to provide a single analytical limit for this trip function.

To perform the safety analysis for the TM/LP trip function, the fuel vendor is provided with the trip setpoint and total loop uncertainties associated with the instrumentation providing input to the TM/LP trip function. The fuel vendor then combines the total loop instrument error with core specific design parameters such as axial shape and rod

peaking factors using the methodology referenced in the Palisades Technical Specifications to assure that the setpoint adequately protects the DNB safety limit.

NRC Question #2

Discuss applicability/compliance with the use of the four conditions for user utilities in the NRC's letter of generic approval of the ultrasonic feedwater flow measurement device, S. Richards to I. Rickard, "Acceptance for Referencing of CENPD-397-P, Revision 01-P, Improved Flow Measurement Accuracy Using Crossflow Ultrasonic Flow Measurement Technology," dated March 20, 2000, with respect to the TM/LP function.

NMC Response

A description of compliance to the four conditions for the Palisades Nuclear Plant is provided in Enclosure 4 of the letter from DE Cooper to U.S. Nuclear Regulatory Commission, "License Amendment Request: Increased Rated Thermal Power," dated June 3, 2003. Use of the Crossflow ultrasonic flow measurement (UFM) system in the TM/LP function is addressed as follows:

The TMMs generate a variable low primary coolant system pressure trip setpoint. This generated setpoint (Pvar) is a function of core thermal power level, axial power shape index, and cold leg temperature. In order to determine the total loop uncertainties associated with the calculated setpoint, uncertainties associated with each of the inputs to the TMMs are determined. Core thermal power level input to the TMMs is provided by the higher of power from the power range nuclear instrumentation (NI), or ΔT power based on primary coolant system hot and cold leg temperatures. Since NI's and ΔT power are calibrated against the secondary calorimetric heat balance, errors associated with the NI and ΔT power input include heat balance uncertainties. The major contributor to secondary heat balance uncertainties is feedwater flow. The feedwater flow error utilized in the TM/LP trip uncertainty analysis is based on the errors associated with the Crossflow UFM system.

The Crossflow UFM system has been in use at Palisades since 1997. The system is presently used to correct for fouling of the feedwater flow venturi nozzles allowing operation near 100% rated thermal power. The uncertainties associated with the Crossflow UFM system were utilized in developing the uncertainties associated with the NI input to the TM/LP trip. Crossflow UFM uncertainties were developed using the methodology described in Section 5 of Topical Report CENPD-397-P-A Revision 1, "Improved Flow Measurement Accuracy Using Crossflow Ultrasonic Flow Measurement Technology," dated May 2000. The currently installed Crossflow UFM is in compliance with the four specified conditions in the NRC acceptance letter for CENPD-397-P.