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VPNPD-93-089
NRC-93-053

April 20, 1993

Document Control Desk
U. S. NUCLEAR REGULATORY COMMISSION
Mail Station P1-137
Washington, DC 20555

Gentlemen:

DOCKETS 50-266 AND 50-301
REQUEST FOR EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 50.60
OVERPRESSURE MITIGATING SYSTEM SETPOINT
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

In accordance with the provisions of 10 CFR 50.12, "Specific Exemptions," Wisconsin Electric Power Company, Licensee for the Point Beach Nuclear Plant, Units 1 and 2, requests an exemption from the requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Light Water Nuclear Power Reactors for Normal Operation." We are requesting this exemption to allow the application of the ASME Section XI Code Case N-514, "Low Temperature Overpressure Protection," in determining the power operated relief valve (PORV) setpoint for low temperature overpressure protection (LTOP).

Specifically, 10 CFR 50.60 requires all power reactors to meet the criteria in Appendix G, "Fracture Toughness Requirements" to 10 CFR 50. Appendix G to 10 CFR 50 requires pressure-temperature limits for the reactor vessel to be at least as conservative as those obtained in using the methods of analysis with margins of safety as established by Appendix G of the ASME Section XI Boiler and Pressure Vessel Code. 10 CFR 50.60 (b) stipulates that an exemption is required to implement alternate methods to those specified in Appendix G to 10 CFR 50.

ASME Code Case N-514 was recently approved by the Boiler and Pressure Vessel Main Committee and the Board of Nuclear Codes and Standards. The Code Case is scheduled to be published with Supplement 4 in May 1993 and is applicable beginning with the 1986 Edition with 1987 Addenda of the ASME Code.

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10 CFR 50.55a, "Codes and Standards," incorporates the use of the ASME Section XI Code through the 1989 Edition and 1988 Addenda. Since Code Case N-514 has not been formally published for use, we request an exemption be granted from 10 CFR 50.60 to implement N-514 in determining the LTOP setpoint applicable to PBNP.

As specified in 10 CFR 50.12, the Commission can grant exemptions from the regulations when special circumstances are present. We believe the requested exemption satisfies the special circumstance criterion of 10 CFR 50.12 (a) (2) (iv) in that operation in accordance with the requested exemption will result in a benefit to the public health and safety. Our evaluation supporting this determination follows.

In 1976 we were requested by the NRC staff to design and install plant systems to mitigate the consequences of pressure transients at low temperatures. The design of the PBNP system utilizes the installed, redundant PORVs with a low pressure setpoint that is enabled after reactor coolant system pressure falls below the actuation setpoint and prior to reactor coolant system temperature falling below the temperature at which the reactor coolant system inservice pressure test is performed. The system design is based on a reference design developed by Westinghouse. The maximum allowed setpoint of 425 psig (reference PBNP Technical Specification 15.3.15.A.1.a) was determined following the methodology developed by Westinghouse.

Our design and setpoint were accepted in a Safety Evaluation (SER) prepared by the NRC staff dated May 20, 1980 which accompanied Amendments 45 and 50 to DPR-24 and DPR-27, respectively. This setpoint was established to insure the Appendix G operating curves (reference PBNP Technical Specification Figure 15.3.1-1) would not be exceeded by a pressure transient at low temperatures.

We were recently informed that the Westinghouse methodology did not account for the differential pressure across the reactor core during reactor coolant pump operation. The pressure input to LTOP is sensed at two locations in the reactor coolant system. These are at the reactor coolant system hot leg and the pressurizer. With both reactor coolant pumps operating, the pressure at the core midplane may be as much as 63 psi higher than at the pressure sensing points.

We reviewed the plant specific setpoint calculations performed for PBNP and have determined that these calculations contain the same error. Adding the correction for the differential pressure across the reactor core to the PBNP setpoint could result in pressure exceeding the Appendix G curves when reactor coolant temperature is below approximately 151.5°F.

We have evaluated lowering the LTOP setpoint to account for the error. This would require lowering the existing setpoint to approximately 380 psig. A minimum of 250 psig differential across reactor coolant pump seals is required for pump operation. With all considerations taken into account, plant operating procedures recommend a minimum system pressure between 320 psig and 350 psig for operating reactor coolant pumps. An LTOP setpoint at or near 380 psig provides little margin for the pressure surge expected from starting reactor coolant pumps with the reactor coolant system in a water solid condition. This could result in increased actuations of the LTOP system and the discharge of reactor coolant from the system. Increased actuations may have an adverse safety impact since increased actuations also increases the possibility of a PORV failure to reseal following an actuation.

Application of the ASME Section XI Code Case N-514 will allow continued operation with the present LTOP setpoint. This minimizes the potential for unnecessary system actuations and PORV failure. Therefore, an adverse safety impact will not occur, resulting in a net benefit to the public health and safety. This satisfies the special criterion specified in 10 CFR 50.12 (a) (2) (iv).

We believe that the requested exemption also satisfies the special circumstance criterion of 10 CFR 50.12 (a) (2) (ii) in that application of the rule is not necessary to achieve the underlying purpose of the rule. We have evaluated single reactor coolant pump operation which lowers the setpoint correction factor to approximately 25 psig. The present LTOP setpoint is acceptable with this correction applied as long as reactor coolant pump operation is limited to one pump below a reactor coolant system temperature of approximately 151.5°F. Appropriate procedure changes and administrative controls were put in place for the Unit 1 maintenance and refueling outage which began on March 27, 1993, to limit operation to one reactor coolant pump when less than 160°F.

Plant operation with administrative restrictions on reactor coolant pump operations while at low reactor coolant system temperatures places an unnecessary burden on plant operators to ensure safety limits are maintained. One reactor coolant pump will be required to be tagged out at all times. This has the potential for confusion if the pump removed from service is required to support specific plant evolutions. We believe this burden is unnecessary and can be alleviated by the application of Code Case N-514.

ASME Code Case N-514 allows setting the LTOP actuation setpoint such that the Appendix G curves are not exceeded by more than 10%. Application of this Code Case to PBNP would allow continued operation with the present setpoint. The restrictions on reactor coolant pump operation would not be necessary. The basis for the LTOP setpoint as documented in the May 20, 1980 SER for the overpressure mitigating system is to preclude reactor coolant system pressure from exceeding the Appendix G curves when there is a potential for brittle failure of reactor vessel material. ASME Code Case N-514 recognizes the conservatism of the Appendix G curves.

As documented in the bases for Code Case N-514, establishing an LTOP setpoint which limits reactor coolant system pressure to no more than 110% of the Appendix G curves provides essentially the same margin of safety as ASME Section XI, Appendix G. Application of Code Case N-514 maintains an acceptable margin of safety while maintaining operational margins for reactor coolant pump operation at low temperatures and pressures. Setpoints established in accordance with N-514 will also minimize system actuations. Therefore, establishing an LTOP actuation setpoint using N-514 criteria satisfies the underlying purpose of the ASME Code, 10 CFR 50.60 and 10 CFR 50.55a which is to ensure nuclear power plant systems and components are designed, maintained and tested to ensure an acceptable level of safety. This satisfies the criterion of 10 CFR 50.12 (a) (2) (ii).

We will continue to analyze and report any LTOP actuations in accordance with Technical Specification 15.6.9.2, "Unique Reporting Requirements," Item C, "Overpressure Mitigating System Operation." This Specification requires evaluation of all LTOP actuations and corrective action be taken if applicable limits could have been exceeded if LTOP was not in operation. These evaluations and any resulting corrective actions provide added assurance that the probability of overpressure initiating events are minimized.

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We request that this exemption from the requirements of 10 CFR 50.60 be processed in an expeditious manner. We commenced a maintenance and refueling outage on Unit 1 on March 27, 1993. Presently, reactor coolant system filling and venting following placement of the reactor vessel head is projected to commence on May 6, 1993. We request that this exemption be processed prior to that time in order that both reactor coolant pumps can be made available to provide maximum flexibility in returning Unit 1 to service.

If you have any questions, please contact us.

Sincerely,

A handwritten signature in dark ink, appearing to read "Bob Link", is written over a light blue horizontal line.

Bob Link
Vice President
Nuclear Power

TGM/cms

cc: NRC Regional Administrator
NRC Resident Inspector