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SUBJECT: Forwards request for relief from inservice hydrostatic test requirement of Section XI, Article IWA-440, of 1986 boiler & pressure vessel code for Class 1 repair & replacement work performed during 1989 & 1991 refueling outages.

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August 12, 1992

US Nuclear Regulatory Commission
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MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Request for Relief from ASME Boiler and Pressure Vessel Code,
Section XI, Reactor Coolant Pressure Boundary Post Repair Hydrostatic Test

The purpose of this letter is to request relief from the Inservice hydrostatic test requirements of Section XI, Article IWA-4400, of the 1986 ASME Boiler and Pressure Vessel Code for certain Class 1 repair and replacement work performed during the 1989 and 1991 refueling outages. Specifically, we are requesting approval to perform alternative testing (system leakage test at normal operating pressure with VT-2 inspection prior to reactor start-up) in lieu of a special post-repair reactor coolant system hydrostatic test.

The details of this request, including background information and reasons for requesting relief, are included in Attachment 1. NRC staff review and approval of this relief request is needed prior to December 1, 1992 to allow time for outage planning.

Please contact us if you require additional information.

Thomas M. Parker
Manager
Nuclear Support Services

cc: Regional Administrator-III, NRC
NRR Project Manager, NRC
Resident Inspector, NRC
State of Minnesota,
Attn: Kris Sanda
J Silberg

Attachment: (1) - Details of Relief Request

A047

Attachment 1

Details of Relief Request

References: (1) Letter from Thomas M Parker (NSP) to NRC, titled "Request for Relief from ASME Boiler and Pressure Vessel Code, Section XI, Section IWA-4400 Pressure Testing Requirements", dated September 11, 1989

(2) Letter from William O Long (NRC) to T M Parker (NSP), titled "Monticello Nuclear Generating Plant - Request for Relief from ASME Boiler and Pressure Vessel Code Section XI, Reactor Coolant Pressure Boundary Post Repair Hydrostatic Test (TAC 74584)", dated October 6, 1989

(3) Letter from Thomas M Parker (NSP) to NRC, titled "Request for Relief from ASME Boiler and Pressure Vessel Code, Section XI, Section IWA-4400 Pressure Testing Requirements", dated February 25, 1991

(4) Letter from William O Long (NRC) to T M Parker (NSP), titled "Monticello Nuclear Generating Plant - Relief from ASME Boiler and Pressure Vessel Code, Section XI-Post Repair hydrostatic Test (TAC 79088)", dated April 8, 1991

(5) Welding Research Council Bulletin 370, dated February 1992, "Recommendations Proposed by the PVRC Committee on Review of ASME Nuclear Codes and Standards"

Code Requirement:

The ASME Boiler and Pressure Vessel Code (hereafter referred to as the ASME Code), Section XI, Subarticle IWA-4400, states (in part): "(a) After repairs by welding on the pressure retaining boundary, a system hydrostatic shall be performed in accordance with IWA-5000".

Proposed Alternate Test:

In lieu of performing a system hydrostatic pressure test on Class 1 repair and replacement work (previously identified in References (1) and (3)) completed during the 1989 and 1991 refueling outages, we propose to perform alternative testing in the form of a system leakage test at normal system operating pressure in conjunction with VT-2 inspection. The test would be conducted in accordance with the rules of Code Case N-498 for Class 1, Category B-P piping and components.

Background:

Section XI of the ASME Code, Articles IWA-2000 (Examination and Inspection), IWA-5000 (System Pressure Tests), and IWB-5000 (System Pressure Tests), and Table IWB-2500-1 (Examination categories) require that a reactor coolant system hydrostatic pressure test be conducted at the end of each 10 year

Inservice Inspection Program interval. For Monticello, this test was to be performed during the 1993 refueling outage. However, the ASME Code Committee on Inservice Inspection reviewed this requirement and on May 13, 1991 approved code case N-498, "Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division I", which permits performance of a system leak test (with VT-2 visual examination) at nominal operating pressure in lieu of the 10 year hydrostatic test.

ASME Code case N-498 does not, however, address repairs or replacements. During the fall 1989 and spring 1991 refueling outages, prior to approval of Code Case N-498, we performed several ASME Class 1 piping repairs and replacements, such as replacement of a flow venturi and isolation valve in the High Pressure Coolant Injection system, replacement of a suction valve in the Reactor Water Cleanup system, and modification of reactor vessel bottom drain piping. Subarticle IWA-4400 and Paragraph IWA-5214 of the Code require that repairs or replacements be subjected to the same pressure test requirements as the applicable system prior to resumption of service. In order to avoid the considerable expense and personnel radiation exposure associated with conducting special reactor coolant system hydrostatic tests during the 1989 and 1991 refueling outages, NSP requested and obtained NRC approval (References 1, 2, 3 and 4) to defer hydrostatic testing of the repairs/replacements until the next regular Inservice Inspection system hydrostatic pressure test. The next regular test, which would have satisfied ASME Section XI requirements for the second 10-year interval, was to be performed during the 1993 refueling outage.

With the advent of Code Case N-498, the need to perform further reactor coolant system Inservice Inspection hydrostatic pressure testing no longer exists. However, we are still bound by ASME Section XI to perform such a test to demonstrate the integrity of the repair and replacement welds performed during the 1989 and 1991 time frames.

Basis for Relief:

10 CFR Part 50, Section 50.55a(a)(3) allows the use of proposed alternatives to Code requirements provided it can be demonstrated that (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements of the section would result in hardship or unusual difficulties without a compensating increase in the level of quality or safety. The following arguments are provided to demonstrate that this relief request meets both criteria:

1. The technical rationale behind Code Case N-498, which permits alternatives to the ASME Section XI Inservice Inspection system hydrostatic test, applies equally to repair and replacement activities. Performance of a hydrostatic test at a pressure greater than the nominal system operating pressure is of little benefit with respect to assuring system integrity, therefore, performance of the test does not provide a compensating increase in quality or safety.

At the request of ASME, the Pressure Vessel Research Council (PVRC) initiated a technical review of current ASME nuclear codes and standards in 1988 to identify areas where improvements were possible (Reference 5). The goals of the review were simplification of the code, elimination of outdated requirements, increased compatibility, and better interfaces between nuclear standards. One of recommendations to come from this review involved simplification of pressure test requirements for Class 1, 2 and 3 components, including repairs and replacements, by requiring an Inservice Leak Test at normal operating temperature and pressure in lieu of all other pressure test requirements.

Acting upon the Pressure Vessel Research Council recommendation, the ASME Inservice Inspection Subcommittee Working Group on Pressure Testing is currently developing a code case similar to Code Case N-498 to provide alternative testing for Section XI repairs and replacements. It is our understanding that the new code case will permit alternative testing similar to what we propose above, which is also equivalent to the alternative testing we performed during the 1989 and 1991 outages as described in References (1) and (3). Work on this code case is progressing and final approval is expected, however, it is unlikely that approval will occur before our 1993 refueling outage which is when we would be required to perform the post-repair system hydrostatic test.

2. Performance of a special post-repair reactor coolant system hydrostatic test during the 1993 refueling outage represents a significant cost, schedule, and ALARA impact on the plant. A discussion of the hardships and difficulties associated with this test is as follows:

   a) Technical Specification 3.6.B.1 requires selection of the hydrostatic test temperature based on pressure (Figure 3.6-2), with an adjustment for beltline fluence (Figure 3.6-1). Based on estimates of fluence at the end of the current cycle, it is calculated that the minimum temperature for conduct of the test will be approximately 205°F. Plant Technical Specifications (3.5.A.1 and 3.5.C.1) require that certain Emergency Core Cooling Systems (ECCS), Core Spray and Low Pressure Coolant Injection specifically, be operable whenever reactor water temperature is 212 °F or greater.

      There is insufficient margin between the minimum test temperature (205°F) and the Technical Specification limit above which ECCS operability is required (212 °F) to allow conduct of the test without the required ECCS systems being available. Requiring these systems to be operable in support of the post repair hydrostatic test complicates outage planning and adds 2 days to the overall outage schedule.

   b) In References (1) and (3), we explained that the performance of a reactor coolant system hydrostatic test would require that the

main steam safety/relief valves either be removed and replaced with blank flanges or gagged by installation of gagging devices to prevent valve actuation during the test. This concern still remains valid, however it should be noted we are currently evaluating a new air gagging technique that is under development. The new technique appears to permit gagging of the safety/relief valves without affecting the mechanical setpoint of the valves, and may offer advantages over installation of blank flanges in terms of requiring less time and exposure to implement. We would still prefer to avoid the installation of either blank flanges or an air gag if possible.

It should also be noted that the 1993 test could be conducted at slightly lower pressure than before (approximately 1.08 P_o (1080 psig) -vs- 1.10 P_o (1100 psig)) per ASME Section XI, Table IWB-5222-1, due to the higher test temperature. However, the margin between the test pressure and the mechanical setpoint of the safety/relief valves (1109 psig $\pm$ 1%) remains so small that either blank flange installation or gagging of the valves is still needed to preclude actuation.

c) Preparation for and performance of the test will increase accumulated outage dose by an estimated 5.4 man-Rem (assuming blank flange installation). It is contrary to the principles of ALARA to accumulate such a large dose unless absolutely necessary.

d) It is estimated that the cost of preparing for and performing a special reactor coolant system post-repair hydrostatic test is $292,000 including replacement power costs. We wish to avoid incurring such a large cost to conduct a special test that is of little technical or practical benefit, especially when it appears that ASME Section XI Code activity will eliminate the requirement for the test in the near future.

3. All of the components and welds involved in this request for relief have already undergone inspection and testing, both by NSP and the component manufacturers. As described in detail in References (1) and (3), various combinations of nondestructive tests including visual examination, liquid penetrant examination, ultrasonic examination, radiographic examination and fabrication/manufacturing hydrostatic tests were used to verify the integrity of the repair and replacement welds and components. The repair and replacement welds were VT-2 inspected during system leakage tests performed during the 1989 and 1991 outages and no problems were noted. In addition, the components have all been in service at normal system pressure for at least a year and no problems have been experienced.

Based on the above, we conclude that the basis for this relief request meets the criteria of 10 CFR Part 50, Section 50.55a(a)(3).