WOLF CREEK
NUCLEAR OPERATING CORPORATION

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WO 96-0014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: Docket No. 50-482: Request for Relief From ASME Section XI Hydrostatic Testing of Class 1 and Class 2 Pressure Boundaries

Gentlemen:

Pursuant to the requirements of 10 CFR 50.55a(a)(3), Wolf Creek Nuclear Operating Corporation requests relief from the requirements of ASME Section XI, 1980 Edition through and including Winter 1981 Addenda, Table IWB-2500-1, "Examination Category B-P," Item Numbers B15.51 and B15.61 and Table IWC-2500-1, "Examination Category C-H," Item Numbers C7.40 and C7.80 for Wolf Creek Generating Station.

Relief is requested on the basis that the proposed alternative provides an acceptable level of quality and safety. In addition, compliance with the specified requirements would result in a hardship without a compensating increase in quality and safety. Attachment I provides the basis for this relief request and the proposed alternative provisions.

If you have any questions concerning this matter, please contact me at (316) 364-8831, extension 4450, or Mr. Richard D. Flannigan, at extension 4500.

Very truly yours,

Otto L. Maynard

OLM/jra

Attachment

cc: L. J. Callan (NRC), w/a
W. D. Johnson (NRC), w/a
J. F. Ringwald (NRC), w/a
J. C. Stone (NRC), w/a

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INSERVICE INSPECTION RELIEF REQURST

Component:

Applicable to ASME Class 1 and Class 2 pressure boundaries on Reactor Coolant System (RCS) branch connection between the RCS Pressure Isolation Valves as follows:

1) RCS Hot Leg Recirculation Lines (4 independent loops) from Safety Injection (SI) System
2) RCS Cold Leg Safety Injection Lines (4 independent loops)
3) RCS Cold Leg High Pressure Safety Injection Lines (4 loops common supply)

Category:

ASME Section XI, 1980 Edition through and including Winter 1981 Addenda, Table IWB-2500-1, Examination Category B-P, Item Numbers B15.51 and B15.61 and Table IWC-2500-1, Examination Category C-H, Item Numbers C7.40 and C7.80.

Description:

Hydrostatic testing of ASME Class 1 and Class 2 pressure boundaries between RCS Pressure Isolation Valves (subject boundaries utilize check valves). These pressure boundaries include a Class 2 piping connection from the Class 1 portion of piping to the associated Safety Injection System Test Line Isolation Valve (Reference Figure 1).

Code Requirement:

Table IWB-2500-1, Category B-P and Table IWC-2500-1, Category C-H require that a system hydrostatic test per IWB-5222 and IWC-5222, respectively, be performed each 10-year inspection interval on pressure retaining components.

Basis for Relief and Proposed Alternative Provisions:

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested on the basis that the proposed alternative provides an acceptable level of quality and safety and pursuant to 10 CFR 50.55a(a)(3)(ii) compliance with the specified requirements would result in a hardship without a compensating increase in quality and safety.

Code testing requirements for the subject boundaries include testing at 1.02 times operating pressures for the Class 1 portions and 1.25 for the Class 2 portions with a 4 hour hold time for insulated portions of systems which includes the subject pressure boundaries of this request for relief. Waiting for the required hold time with subsequent visual examination can substantially extend outage time (e.g., testing of the subject branch connections with the 4 hour hold time can result in an additional 36 hours of critical path time). Personnel exposure is also greatly affected because the subject pressure boundaries are located within the primary personnel protection wall, typically referred to as the "bioshield." Insulation removal to reduce the ASME Code required hold time to ten minutes is not a viable option since this would require a substantial increase in the number of man-hours spent within the bioshield which is typically a high radiation dose area. This also creates a personnel hazard associated with reinstallation of the insulation on the greater than 500°F piping surface. In addition, testing at the elevated hydrostatic testing pressures causes considerable hardship. To minimize schedule impact, this testing would be performed in conjunction with other plant startup activities such as RCS Pressure Isolation Valve testing. To attain the required conditions for the other testing, it would require an additional cycle of RCS pressurization as discussed below.

As part of Wolf Creek Generating Station's (WCGS) NRC Safety Evaluation Report (SER) for use of ASME Code Case N-498-1, Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems, it was stated that, "the system hydrostatic test is not a test of the structural integrity of the system but rather an enhanced leakage test. That the original intent was an enhanced leakage test is documented in a paper by S.H. Bush and R.R. Maccary, 'Development of In-Service Inspection Safety Philosophy for U.S.A. Nuclear Power Plants,' ASME, 1971." The safety evaluation further states, "The industry indicates that experience has demonstrated that leaks are not being discovered as a result of hydrostatic test pressures propagating a preexisting flaw through wall. They indicate that leaks in most cases are being found when the system is at normal operating pressure." The safety evaluation continues to state that considering the minimal amount of increased assurance resulting from the higher hydrostatic test pressures and the hardship associated with performing the ASME Code required hydrostatic test, the NRC staff identified that, "compliance with the Section XI hydrostatic testing requirements results in hardship and/or unusual difficulty for the licensees without a compensating increase in the level of quality and safety."

Recognizing that hydrostatic tests result in hardship and/or unusual difficulty without a compensating increase in the level of quality and safety, Wolf Creek Nuclear Operating Corporation proposes two alternatives to confirm that no boundary leakage is present at the subject locations. The description and technical basis of these alternatives are discussed as follows:

Alternative 1) Pressure boundaries at adequate pressures

WCGS Technical Specification Surveillance Requirement 4.4.6.2.2 requires that each RCS Pressure Isolation Valve specified by Table 3.4-1 is demonstrated to be OPERABLE prior to entering Mode 2 following completion of the unit's refueling outage. To satisfy this requirement for the second isolation valve, the Class 1 and Class 2 pressure boundary located between the first and second isolation valves is pressurized by means of a hydrostatic testing pump to approximately 50 psig below the RCS pressure and then valve leakage is measured through the Safety Injection System Test Line (line 2 on Figure 1). Upon completion of each valve test, the pump is secured without venting or draining the pressure boundary.

Because the WCGS Technical Specifications require re-performance of the leakage test whenever flow occurs through one of the RCS Pressure Isolation Valves, it is necessary to raise the RCS pressure to approximately 2300 (which is > 1.02 times normal RCS operating pressure) and limit the pressure between the valves at 2235 psig to preclude flow through the first isolation valve. As discussed in the WCGS SER for use of Code Case N-498-1, the normal operating pressure is reasonable for use as the pressure for pressure boundary leakage examinations.

Although the subject pressure boundaries are isolated from the hydro pump while at test pressures following completion of valve testing, it is understood that valve leakage may occur over time. This leakage will occur until equalization of the volume upstream and downstream of the valve occurs. Leakage may also occur in such a way as to maintain pressure in the subject boundary, i.e., leakage from the first isolation valve. The presence of pressure was verified by performance of pressure measurements in January 1996 (approximately 13 months into the current fuel cycle). Most of the subject boundaries were pressurized greater than 2200 psig which is near the RCS normal operating pressure of 2235 psig

In March, 1988, Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," was issued to all licensees of operating PWRs. A boric acid corrosion monitoring program was developed in response to the requirements of the generic letter. The program in place at WCGS consists of a method to detect evidence of boric acid leakage at the beginning of each refueling outage and other times as directed by WCGS Management. Essentially, the full Class 1 system and a majority of the Class 2 systems containing boric acid are walked down each refueling outage by personnel certified to a minimum Level II Visual Examination VT-2. This inspection identifies any sources of leakage, including pressure boundary leakage. On insulated portions of a system, evidence of leakage is observable; however, the exact source of the leakage may not be identifiable until portions of the insulation is removed and additional testing is performed to allow direct observation. The inspection performed by the boric acid corrosion monitoring program is sufficient to confirm that no pressure boundary leakage is present in the subject locations.

For the subject pressure boundaries verified as maintaining a pressure of at least 2000 psig (which is approximately 90% of RCS operating pressure) for the Code required hold time of 4 hours during the current fuel cycle (cycle 8), WCNOC requests relief from the First 10-Year Inservice Inspection Interval Section XI requirements for performing the 10-year system hydrostatic testing of the Class 1 and Class 2 pressure boundaries located between the RCS Pressure Isolation Valves. Relief is requested on the basis that the verification of pressure greater than 2000 psig for a minimum of four hours in combination with the inspections implemented as a result of Generic Letter 88-05 provide an alternative which provides an acceptable level of quality and safety. The implementation of a separate test to apply ASME Section XI 10-year system hydrostatic test pressure and hold time requirements to these pressure boundary locations would result in a hardship to WCNOC in the form of additional testing, financial burden and additional dose to personnel without a compensating increase in quality and safety.

Alternative 2) Pressure boundaries not at adequate pressures

During the pressure measurements of the subject pressure boundaries discussed above, a few locations were measured at less than 2000 psig. Although these locations were measured at less than 2000 psig, they were initially pressurized to the RCS operating pressure of 2235 psig during valve testing. It is probable that any pressure boundary leakage will still be identified by the boric acid monitoring inspections. However, since the length of time at pressure greater than 2000 psig cannot be determined, a flow test is proposed to supplement the boric acid monitoring program inspections. During RCS Pressure Isolation Valve leakage testing, following a pressurization hold time of 10 minutes, the amount of water used as the pressure source and the identified valve leakage can be measured and

compared. If a discrepancy is identified between the measurements, it will be evaluated taking into consideration the impact from other sources of leakage and equipment inaccuracies. This flow test supplementing the boric acid monitoring program inspections will adequately confirm that no pressure boundary leakage is present in the subject locations.

For the subject pressure boundaries verified as not maintaining a pressure of at least 2000 psig for the Code required hold time of 4 hours during the current fuel cycle (cycle 8), WCNOC requests relief from the First 10-Year Inservice Inspection Interval Section XI requirements for performing the 10-year system hydrostatic testing of the Class 1 and Class 2 pressure boundaries located between the RCS Pressure Isolation Valves. Relief is requested on the basis that the combined boric acid monitoring program inspections implemented as a result of Generic Letter 88-05 and the comparison of the pressure source and leakage measurements, provide an alternative which provides an acceptable level of quality and safety. The implementation of a separate test to apply ASME Section XI 10-year system hydrostatic test pressure and hold time requirements to these pressure boundary locations would result in a hardship to WCNOC in the form of additional testing, financial burden and additional dose to personnel without a compensating increase in quality and safety.

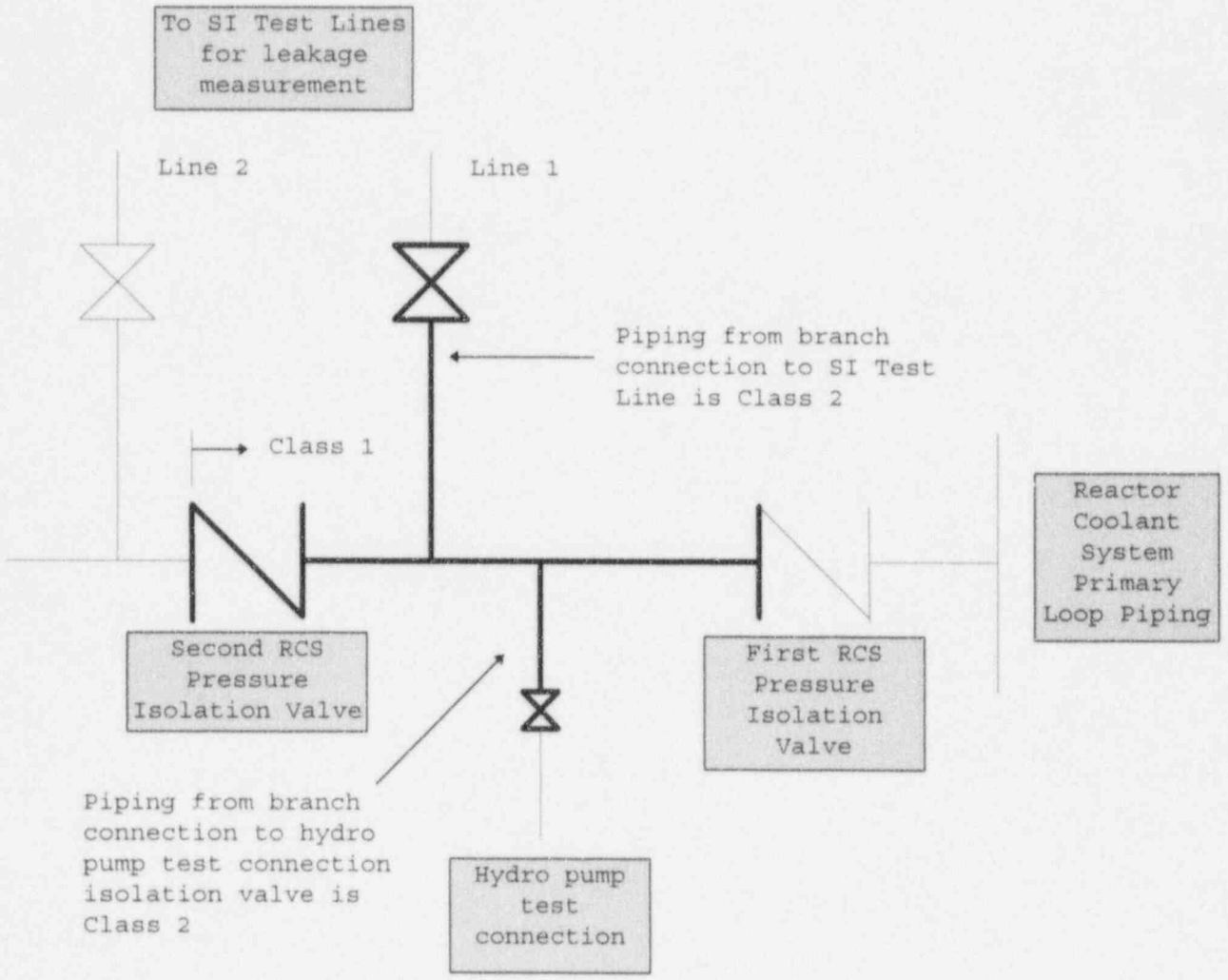

FIGURE 1

General RCS Pressure Isolation Valve Pressure Boundary Representation
(Bold lines represent boundary subject to relief)