



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ON REQUEST FOR RELIEF NO. 95-04

FOR

DUKE POWER COMPANY

CATAWBA NUCLEAR STATION, UNIT 2

DOCKET NO. 50-414

1.0 INTRODUCTION

The Technical Specifications for Catawba Nuclear Station, Unit 2, state that the inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Catawba Nuclear Station, Unit 2, first 10-year inservice inspection (ISI) interval is the 1980 Edition, through Winter 1981 Addenda. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

By letter dated July 25, 1995, as supplemented September 18 and October 5, 1995, Duke Power Company (the licensee) requested relief from the ASME Boiler and Pressure Vessel Code, Section XI requirement to perform a system hydrostatic test and VT-2 visual examination on the Containment Valve Injection Water (NW) System for Catawba Nuclear Station, Unit 2. The NRC staff has reviewed and evaluated the supporting information regarding the licensee's alternative contained in Request for Relief No. 95-04 for Catawba Nuclear Station, Unit 2.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its first 10-year ISI program plan, request for relief regarding examination Category C-H, Items No. C7.20, C7.40 and C7.80, system hydrostatic test requirements for Catawba Nuclear Station, Unit 2.

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the attached Technical Letter Report. The staff has concluded that imposing the Code-required hydrostatic test of the subject system will result in a burden without a compensating increase in the level of quality and safety. Therefore, the licensee's proposed alternative to Code requirements is authorized for Request for Relief 95-04, pursuant to 10 CFR 50.55a(a)(3)(ii), provided that the licensee performs the Appendix J leak test at the peak calculated containment pressure and that a test procedure is implemented that provides for detection and location of through-wall leakages in the pipe segments that are being tested.

Attachment: Technical Letter Report

Principal Contributor: T. McLellan

Date: February 6, 1996

TECHNICAL LETTER REPORT
ON THE FIRST 10-YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF 95-04
FOR
CATAWBA NUCLEAR STATION, UNIT 2
DUKE POWER COMPANY
DOCKET NUMBER: 50-414

1.0 INTRODUCTION

By letter dated July 25, 1995, Duke Power Company submitted Request for Relief 95-04 for Catawba Nuclear Station, Unit 2, concerning the system hydrostatic test and VT-2 visual examination on the Containment Valve Injection Water System (NW). By letter dated September 18, 1995, the licensee provided additional information in response to an electronic communication from R. E. Martin (Nuclear Regulatory Commission) to Z. L. Taylor (Duke Power) dated September 11, 1995. In response to a September 25, 1995, conference call between the Nuclear Regulatory Commission (NRC), Idaho National Engineering Laboratory (INEL), and Duke Power Company, the licensee provided additional clarification by letter dated October 5, 1995. The INEL staff has evaluated the subject request for relief in the following section.

2.0 EVALUATION

The Code of record for Catawba Nuclear Station, Unit 2, first 10-year interval, is the 1980 Edition through the Winter 1981 Addenda of the *American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI*. The information provided by the licensee in support of the request for relief from Code requirements has been evaluated and the basis for disposition is documented below.

Request for Relief 95-04, Examination Category C-H, Items C7.20, C7.40, and C7.80, System Hydrostatic Test Requirements

Code Requirement: Table IWC-2500-1, Examination Category C-H, Items C7.20, C7.40, and C7.80 require a system hydrostatic test once each inspection interval in accordance with IWC-5222.

Licensee's Code Relief Request: The licensee requested relief from performing a system hydrostatic test and VT-2 visual examination on the Containment Valve Injection Water System (NW).

Licensee's Basis for Requesting Relief (as stated):

"Although the NW surge chambers are maintained greater than 38 psig, the NW system piping is not pressurized during normal plant operation; therefore, the use of Code Case N-498 is not practical. The NW system has Class 2 piping on adjacent sides of the containment penetration isolation valves; therefore, the use of Code Case N-522 is not practical. Since hydrostatic testing would involve pressurizing the NW piping up to each containment isolation valve that the system serves, the potential exists for NW fluid to be injected into the process line in which the isolation valve is contained. This water intrusion could cause a variety of problems including slight dilution of the Safety Injection system or the Chemical and Volume Control system."

"The purpose of the Code required pressure test is to ensure system integrity. The Code required test cannot be performed in such a manner as to ensure system integrity without risking dilution of the Safety Injection system or the Chemical and Volume Control system. The alternative test as stated in Section V¹ above will be conducted during each refueling outage and is designed to ensure the NW system is capable of performing its safety function. Leakage above the acceptance criteria stated in Section V above will be evaluated for corrective action."

Licensee's Proposed Alternative Examination (as stated):

"In lieu of the IWC-5222 hydrostatic test, the following alternative testing will be performed:

"The containment isolation valves served by the NW system together with the NW system will be tested simultaneously. The NW system will be pressurized to ≥ 1.10 Pa (10% above design containment pressure) and then

¹Section V refers to the licensee's alternative.

leak rate tested by injecting seal water to the containment isolation valves. To assure that an open path exists to each containment isolation valve, individual valves will be opened and the NW surge chamber level verified as decreasing. Once an open path to each containment isolation valve has been verified, and the containment isolation valve closed, the overall system leakage will be determined by measuring the flow rate of seal water out of the NW surge chamber. Leakage will be measured using either process flow meters or by measuring the drop in the NW surge chamber level over a period of time and calculating the volume of water per unit time. Total containment isolation valve seat leakage allowed is equal to or less than 1.19 gallons per minute with the NW surge chamber pressure greater than or equal to 38 psig for NW train "2A" and equal to or less than 1.12 gallons per minute with the NW surge chamber pressure greater than or equal to 38 psig for NW train "2B".

Evaluation: The Code requires that a system hydrostatic test be performed once each inspection interval. The licensee has requested relief from performing a hydrostatic test of the Containment Valve Injection Water System because pressurizing the lines to hydrostatic test pressures could, potentially, inject seal water into the Safety Injection and/or Chemical and Volume Control systems. In addition, in the October 5, 1995, submittal the licensee stated that performance of the Code-required hydrostatic test requires 35 separate tests that will result in an increased man-rem exposure of 1,400 millirem.

As an alternative, the licensee proposes to perform the NW system pressure test in conjunction with the Appendix J Test at ≥ 1.10 Pa (10% above design containment pressure) and then perform a leak rate test by injecting seal water to the containment isolation valves. An open path to each containment isolation valve will be verified, and then the containment isolation valve closed. The overall system leakage will be determined by measuring the flow rate of seal water out of the NW surge chamber. Leakage will be measured either by process flow meters or by measuring the drop in the NW surge chamber level over a period of time and calculating the volume of water per unit time.

Based on this evaluation, it has been determined that imposing the Code-required hydrostatic test of the subject system will result in a burden without a compensating increase in the level of quality and safety. The

INEL staff believes that the pressure retaining integrity of the piping and their associated safety functions may be verified by Appendix J tests, provided that the licensee performs the leak test at the peak calculated containment pressure and that a test procedure is implemented that provides for detection and location of through-wall leakages in the piping being tested.

3.0 CONCLUSION

The INEL staff has evaluated the subject request for relief and determined that imposing the Code-required hydrostatic test for the NW System will result in a hardship without a compensating increase in the level of quality and safety. Therefore, it is recommended that the proposed alternative to Code requirements be authorized for Request for Relief 95-04, pursuant to 10 CFR 50.55a(a)(3)(ii), provided that the licensee performs the Appendix J leak test at the peak calculated containment pressure and that a test procedure is implemented that provides for detection and location of through-wall leakages in the pipe segments that are being tested.