

September 12, 2001

Mr. David A. Christian
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: NORTH ANNA POWER STATION UNIT 1 RE: ASME SECTION XI INSERVICE
INSPECTION (ISI) INTERVAL RELIEF REQUEST SPT-9 (TAC NO. MB1130)

Dear Mr. Christian:

This letter authorizes the use of an alternative pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a) for North Anna Power Station, Unit 1.

By letter dated January 29, 2001, Virginia Electric and Power Company sought relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section XI associated with Code-required hydrostatic testing and system pressure tests.

Our evaluation and conclusion are contained in the enclosed Safety Evaluation. The staff has concluded that your proposed alternative provides an acceptable level of quality and safety. The alternative you requested is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval.

The staff has completed its evaluation of this request; therefore, we are closing TAC No. MB1130.

Sincerely,

/RA by R. Martin Acting for/

Richard L. Emch Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-338

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF SPT-9

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION

NORTH ANNA POWER STATION, UNIT 1

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

1.0 INTRODUCTION

The inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code (Code) Class 1, Class 2, and Class 3 components is to be performed in accordance with Section XI of the ASME Code and applicable edition and 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). 10 CFR 50.55a(a)(3) states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that: (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 difficulty 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) will 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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for North Anna Power Station Unit 1 third 10-year ISI interval is the 1989 Edition of Section XI of the ASME B&PV Code.

2.0 DISCUSSION

By letter dated January 29, 2001, the Virginia Electric and Power Company (licensee) requested relief from the hydrostatic testing and system pressure test requirements in Section XI of the ASME Code.

ENCLOSURE

RELIEF REQUEST SPT-9, ASME XI REQUIREMENTS

Code Requirements for which Relief is Requested

Table IWC-2500-1, Examination Category C-H, Items C7.30 and C7.70 require a system pressure test each inspection period and Items C7.40 and C7.80 require a system hydrostatic test each inspection interval.

Licensee's Basis for Relief

The sole safety function of the piping and associated valves listed is to provide containment isolation. The components listed are part of the containment system. Containment penetrations are classified as Class 2 per ANSI 18.2, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants," section 2.3.1.2(1). For the subject penetrations the connecting piping beyond the containment isolation valves serves no safety function and is classified as non-class by the classification criteria used by [VEPCO] for North Anna Unit 1.

The ASME Section XI pressure testing requirements have verified leak-tight integrity by an over pressure test every ten years and a nominal operating test every inspection period. The 10-year hydrostatic tests were considered inordinately burdensome for the marginal benefit in safety they assure and have been eliminated by Code Case N-498-1, "Alternative Rules for 10-year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division 1," which has been approved by Regulatory Guide 1.147, Inservice Inspection Code Case Acceptability, ASME Section XI Division 1. The 10-Year hydrostatic test is now conducted at nominal operating pressure.

The subject penetrations are Type C pressure tested to a peak containment internal pressure of greater than or equal to 44.1 psig. This test is performed to satisfy Technical Specification Surveillance Requirement 4.6.1.2 which requires all containment penetrations to be leak rate tested as required by 10 CFR 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guideline contained in Regulatory Guide 1.163, dated September 1995. The testing frequency of 10 CFR 50, Appendix J, Option B is performance based and can vary from 2 years to 5 years or three refueling cycles. This frequency does not coincide with the inspection period frequency required in Table IWC-2500-1 for system pressure tests and, therefore, the ASME Code in effect at North Anna requires additional leak tightness testing.

The ASME Section XI Code has acknowledged that testing of these components beyond the requirements of Appendix J is not necessary and issued Code Case N-522, "Pressure Testing of Containment Penetration Piping," to define its position.

NUREG-1493, "Performance-Based Containment Leak Test Program," concluded that prescriptive leak rate testing could be replaced with performance based requirements with only a marginal and acceptable impact on safety. The total cost of testing Type B (electrical penetrations) was estimated to be \$87,500

per outage for North Anna as reported in NUREG-1493. NUREG-1493 estimates that 5% of the total cost of Type B & C testing could be saved if the acceptance criteria were relaxed. The additional cost of performing ASME Section XI pressure testing beyond the requirements of 10 CFR 50, Appendix J, Option B testing is not commensurate with the insignificant gain in operational safety.

Licensee's Proposed Alternative to Code

As an alternative to the testing frequency and pressures required by Table IWC-2500-1, Examination Category C-H, Items C7.30, C7.40, C7.70, and C7.80, the subject penetrations and associated piping and valves will be pressure tested at peak containment calculated pressures to the requirements of 10 CFR Appendix J, as allowed by Code Case N-522. Testing will be performed in accordance with Technical Specification Surveillance Requirement 4.6.1.2, which requires all containment penetrations to be leak rate tested as required by 10 CFR 50, Appendix J Option B, as modified by approved exemptions, and in accordance with the guideline contained in Regulatory Guide 1.163, dated September 1995.

All subject penetrations will be Type C tested at least once every 60 months in accordance with the Technical Specifications. Methods for the detection and location of leakage at containment isolation valves and the pipe segments between the containment isolation valves will be identified in procedures.

3.0 EVALUATION

Code Case N-522 discusses the alternative to the rules of Table IWC-2500-1, Category C-H for pressure testing piping that penetrates a containment vessel. This applies when the piping and isolation valves that are part of the containment system are Class 2 but the balance of the piping system is outside the scope of ASME Section XI. The Code case further states that 10 CFR 50, Appendix J may be used as an alternative to the rules in Table IWC-2500-1, Category C-H for pressure testing piping that penetrates a containment vessel, when the piping and isolation valves that are part of the containment system are Class 2 but the balance of the piping system is outside the scope of Section XI.

Regulatory Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1, Rev.12*, dated May 1999, authorizes the use of Code Case N-522 subject to the following condition in addition to those conditions in the Code case. The test should be conducted at the peak calculated containment pressure and the test procedure should permit the detection and location of through-wall leakage in containment isolation valves (CIVs) and pipe segment between the CIVs. The licensee, in their January 29, 2001 submittal, has committed to implementation of the Code case at peak calculated containment pressure and is, therefore, acceptable.

10 CFR 50, Appendix J, Option B identifies the performance-based requirements and criteria for preoperational and subsequent periodic leakage-rate testing. Furthermore, it states that the specific guidance concerning a performance-based leakage test program, acceptable leakage-rate test methods, procedures, and analyses that may be used to implement these requirements and criteria are provided in Regulatory Guide 1.163, *Performance-Based*

Containment Leak-Test Program, dated September 1995. The licensee, in their January 29, 2001 submittal, has committed to the implementation and frequency guidance in accordance with 10 CFR 50, Appendix J, Option B and Regulatory Guide 1.163 and is, therefore, acceptable.

4.0 CONCLUSION

Based on the discussion above, the staff concludes that the alternative proposed in Relief Request No. SPT-9 will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative, Relief Request SPT-9, is authorized for the third 10-year ISI interval.

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Date: September 12, 2001

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