

May 14, 2002

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

SUBJECT: NORTH ANNA POWER STATION UNIT 2 RE: ASME SECTION XI INSERVICE
INSPECTION (ISI) PROGRAM RELIEF REQUEST PARTIAL-1 (TAC NO.
MB4084)

Dear Mr. Christian:

This letter grants the relief you requested for Partial-1 for the North Anna Power Station, Unit 2.

By letter dated February 19, 2002, Virginia Electric and Power Company requested relief from certain ISI requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI. The protrusion of the reactor vessel nozzles from the reactor vessel head had prevented the complete examination of the three nozzle-to-vessel welds.

Our evaluation and conclusion are contained in the enclosed Safety Evaluation. The staff has concluded that the requirements of Section XI of the ASME Code are impractical for the subject welds and reasonable assurance of structural integrity is provided by the completed examinations. The relief you requested is authorized pursuant to Title 10 of the *Code of Federal Regulations* Section 50.55a(g)(6)(i) for the second 10-year ISI interval.

The staff has completed its evaluation of this request; therefore, we are closing TAC No. MB4084.

Sincerely,

/RA/

John A. Nakoski, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-339

Enclosure: As stated

cc w/encl: See next page

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Virginia Electric and Power Company

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF PARTIAL-1

SECOND 10-YEAR INSERVICE INSPECTION INTERVAL

NORTH ANNA POWER STATION, UNIT 2

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-339

1.0 INTRODUCTION

By letter dated February 19, 2002, Virginia Electric and Power Company (the licensee) requested relief from certain inservice examination requirements of the 1986 Edition of the American Society of Mechanical Engineers (ASME) Code, Section XI, in regard to volumetric examinations conducted on three reactor vessel outlet nozzle-to-shell welds identified as nos. 10, 12, and 14 during the second 10-year inservice inspection (ISI) interval of North Anna, Unit 2. The licensee stated that the welds were examined to the extent practical. Due to weld joint geometry, the reduction in coverage was greater than 10%. The protrusion of the nozzle beyond the shell physically restricted access for 100% coverage of the clockwise and counter-clockwise scans from the vessel shell.

2.0 BACKGROUND

The ISI of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (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).

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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable ISI Code of Record for the second 10-year ISI interval for the North Anna Power Station, Unit 2, is the 1986 Edition of ASME Section XI.

Enclosure

2.1 Request for Relief

Pursuant to 10 CFR 50.55a(g)(5), if the licensee has determined that conformance with certain Code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in 10 CFR 50.4, information to support the determination. 10 CFR 50.55a(g)(6)(i) states that the Commission will evaluate determinations under 10 CFR 50.55a(g)(5) that Code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

3.0 DISCUSSION (RELIEF REQUEST PARTIAL-1)

3.1 Identification of Components

<u>Mark/Weld#</u>	<u>Line#</u>	<u>Drawing#</u>	<u>Class</u>
10	2-RC-R-1	12050-WMKS-RC-R-1.1	1
12	2-RC-R-1	12050-WMKS-RC-R-1.1	1
14	2-RC-R-1	12050-WMKS-RC-R-1.1	1

3.2 Code Requirements

The 1986 Edition of ASME Section XI, Table IWB-2500-1, Examination Category B-D, Item Number B3.90, does not allow any limitations to the required volumetric examinations. However, Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," which has been approved for use by NRC in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability-ASME Section XI, Division 1," allows a reduction in coverage if it is less than 10%.

3.3 Code Requirements from which Relief Is Requested

Pursuant to 10 CFR 50.55a(g)(5), relief is requested from the volumetric examination coverage requirements of the 1986 Edition of ASME Code, Section XI, Table IWB-2500-1, Examination Category B-D, Item Number B3.90 for the identified reactor vessel outlet nozzle-to-shell welds.

3.4 Licensee's Basis for Relief

Reactor vessel outlet nozzle-to-shell welds 10, 12, and 14 have been examined to the extent practical as required by the Code. Due to weld joint geometry, the reduction in coverage for the listed components was greater than 10%. The protrusion of the nozzle beyond the shell physically restricted access for 100% coverage of the clockwise and counter-clockwise scans from the vessel shell. One hundred percent of the weld volume was covered from the nozzle bore. Table Partial-1 is provided to detail the limitations experienced during the March 2001 examination. Sketch Partial 1 has also been provided to show the limitations of examining the reactor vessel outlet nozzle-to-shell welds. Although less than the Code-required coverage was obtained, this examination provided an acceptable level of quality and safety.

3.5 Licensee's Alternate Provisions

The licensee proposed that the examinations already completed at the reduced coverage during the March 2001 refueling outage be accepted as meeting the Code requirements.

4.0 EVALUATION

The ASME Code, Section XI, 1986 Edition, requires volumetric examination coverage of 100% of the reactor vessel outlet nozzle-to-shell weld. However, a reduction in examination coverage of less than 10% due to interferences is acceptable as provided by Code Case N-460 that was approved by the NRC in RG 1.147. During the second 10-year inspection interval, the reactor vessel outlet nozzle-to-shell welds identified in the February 19, 2002, submittal as nos. 10, 12, and 14 were examined in the transverse direction with an average of 60.5% volumetric coverage and in the axial direction from the nozzle bore for 100% volumetric coverage. This resulted in an average volumetric coverage of 80.25% in lieu of the Code-required coverage in excess of 90%. The limitation in examination coverage was attributed to the protrusion of the nozzle into the vessel interior, which restricted scanning from one side of each weld from the interior surface of the reactor vessel. The licensee has examined the subject welds to the maximum extent practical by ultrasonic examination. The staff has determined that it is impractical to perform the Code-required examination of the subject nozzle-to-shell welds due to the interference of the nozzle protrusion. In order to comply with the Code requirement, a design modification of the reactor vessel will be required that would impose a significant burden upon the licensee. However, the staff finds that the volumetric examination conducted for each weld provides reasonable assurance of structural integrity of the weld since any significant pattern of degradation in the weld would have been detected with a high degree of confidence during examination of the accessible 80.25% of weld volume. Furthermore, in the highly unlikely event that a service-induced flaw in the unexamined region of the weld propagates to the inside surface of the weld, the staff determined that it would most likely be detected during the Code-required VT-3 visual examination of the reactor vessel interior surface, also conducted during the inspection interval.

5.0 CONCLUSION

The staff has reviewed the licensee's submittal and concludes that compliance with the Code requirements are impractical for the reactor vessel outlet nozzle-to-shell weld nos. 10, 12, and 14 due to interference caused by the nozzle protrusions into the interior surface of the reactor vessel. The staff has further determined that if the Code requirements were to be imposed on the licensee, then the nozzles would have to be redesigned, imposing a significant burden upon the licensee. In addition, the staff finds that the completed examination coverages provide reasonable assurance of structural integrity for the subject welds. Therefore, relief is granted from the Code requirement pursuant to 10 CFR 50.55a(g)(6)(i) for the second 10-year ISI interval for North Anna, Unit 2.

The relief granted is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Principal Contributor: P. Patnaik

Date: May 14, 2002