February 15, 2000

Mr. J. P. O'Hanlon
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 RELIEF REQUEST NOS. NDE-047 AND NDE-048 (TAC NO. MA6113)

Dear Mr. O'Hanlon:

The purpose of this letter is to grant the relief you requested for North Anna Power Station, Unit 1 in Relief Request Nos. NDE-047 and NDE-048 related to your inservice inspection programs.

In your letter dated June 22, 1999, you requested relief from certain weld examination requirements of the ASME Code, Section XI, related to examinations of welds where only partial coverage could be obtained because of weld geometry or interferences.

Based on our evaluation of your relief requests, we have concluded that, for North Anna Unit 1, the proposed alternative examinations for relief requests NDE-047 and NDE-048 provide an acceptable level of quality and safety, are authorized by law and will not endanger life or property or the common defense and security, and are otherwise in the public interest giving due consideration to the burden that could result if the relief were not granted. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), the proposed alternative is authorized. The staff's evaluations and conclusions are contained in the Enclosure.

The staff has completed its evaluation of this matter; therefore, we are closing TAC No. MA6113.

Sincerely,

/RA/

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: North Anna Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE SECOND INSERVICE INSPECTION PROGRAM
RELIEF REQUEST NOS. NDE-047 AND NDE-048

NORTH ANNA POWER STATION UNIT 1

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

1.0 INTRODUCTION

By letter dated June 22, 1999, Virginia Electric and Power Company (the licensee) submitted two requests for relief from the American Society of Mechanical Engineers (ASME) Code Section XI nondestructive examination requirements. The staff has evaluated the licensee's requests for relief pursuant to the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i).

2.0 BACKGROUND

Inservice inspection of the ASME Code Class 1, 2 and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(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 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) 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 Code of record for the North Anna Power Station Unit 1 for the second 10-year interval is the 1983 Edition of Section XI of the ASME B&PV Code.

Pursuant to 10 CFR 50.55a(g)(5)(iii), 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 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.

3.0 EVALUATION

3.1 Licensee's Relief Request NDE-047

The components for which relief is requested:

Mark/Weld#	Line#	Drawing#	Class
38	27½"-RC-6-2501R-Q1	11715-WMKS-0109F-1	1
N-SE29IN.	29"-RC-7-2501R-Q1	11715-WMKS-RC-E-1C.2	1
N-SE31IN.	31"-RC-8-2501R-Q1	11715-WMKS-RC-E-1C.2	1

Applicable Code requirement from which relief is requested (as stated by the licensee):

> The 1983 edition, Summer 1983 Addenda (inclusive) of ASME Section XI in Table IWB-2500-1 does not allow any limitations to the required volumetric and surface examinations. Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds, allows a reduction in coverage, if it is less than 10%.

Licensee's Basis for Requesting Relief

"The components listed above have been examined to the extent practical as required by the Code. Due to interference of other components or weld joint geometry, the reduction in coverage for the listed components was greater than 10%... Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code."

The ultrasonic examination volume of the pipe-to-reactor coolant pump weld # 38 was limited due to the weld joint configuration along with the material type. The weld volume was examined to the extent practical using 45 and 60 degree transmit-receive-longitudinal (TRL) transducers. The examination coverage was limited to 52.5%.

The ultrasonic examination volume of the safe end-to-steam generator hot leg nozzle weld N-SE29 IN. was limited due to the joint configuration. The weld was examined to the extent practical using 34 (45 degree effective angle) and 45 degree TRL transducers. The examination coverage was limited to 79.8%.

The ultrasonic examination volume of the safe end-to-steam generator cold leg nozzle weld N-SE31 IN. was limited due to the joint configuration. The weld was examined to the extent practical using 34 (45 degree effective angle) and 45 degree TRL transducers. The examination coverage was limited to 78.8%.

Licensee's Proposed Alternative Examination (as stated)

> It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements.

Staff Evaluation

The staff has evaluated the limitations to the volumetric examinations for the reactor coolant pump weld and the steam generator hot leg and cold leg nozzle welds. The staff has determined that it is impractical to obtain the Code-required volumetric examination coverage due to the configuration of the components being examined. To complete the Code-required ultrasonic examinations would require the system to be redesigned and/or replacement of components in order to comply with the Code requirements. Imposition of this requirement would create a considerable burden on the licensee.

The licensee has scanned the welds on the above components using ultrasonic transducers with two different scan angles to optimize volumetric coverage. The licensee's best-effort examinations have resulted in volumetric coverages of 52.5, 79.8, and 78.8 percent for the three welds covered by this relief request. The staff finds that the extent of examinations performed on the subject welds would detect any significant patterns of degradation, if they existed. The subject welds are required to receive surface examinations each interval in addition to the applicable system pressure test with a VT-2 visual examination in accordance with the requirements of IWA and IWB-5000. Consequently, the limited volumetric examination, the surface examination, and the VT-2 visual examination of each weld will provide reasonable assurance of the continued structural integrity of the welds. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for relief request NDE-047.

3.2 Licensee's Relief Request NDE-048

The components for which relief is requested:

Mark/Weld#	Line#	Drawing#	Class
1	CH-FL-4B	11715-WMKS-CH-FL-4B	2
2	CH-FL-4B	11715-WMKS-CH-FL-4B	2
1	SI-TK-2	11715-WMKS-SI-TK-2	2
3	SI-TK-2	11715-WMKS-SI-TK-2	2
4	SI-TK-2	11715-WMKS-SI-TK-2	2

Applicable Code requirement from which relief is requested (as stated by the licensee):

> The 1983 edition, Summer 1983 Addenda (inclusive) of ASME Section XI in Table IWC-2500-1 does not allow any limitations to the required volumetric and surface

examinations. Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds, allows a reduction in coverage, if it is less than 10%.

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

"The components listed above have been examined to the extent practical as required by the Code. Due to interference of other components or weld joint geometry the reduction in coverage for the listed components was greater than 10%... Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code."

There are two examinations for Weld 1 on SI-TK-2 that are subject to this relief request. One examination was the normally schedule[d] Section XI exam and the other was an expansion examination due to an indication found on Weld 2 on SI-TK-2. The examinations cover different portions of Weld 1.

Licensee's Proposed Alternative Examination (as stated):

It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements.

Staff Evaluation

ASME Code, Section XI, Examination Category C-A, Item C1.20 requires 100% volumetric examination , as defined by Figure IWC-2500-1, for head circumferential welds.

Pursuant to 10 CFR 50.55(a)(g)(5)(iii), the licensee requested relief from the Code coverage requirements for the following welds listed below:

Component	Weld #	Line Number	Coverage
Seal Injection Filter	1	CH-FL-4B	70.0%
Seal Injection Filter	2	CH-FL-4B	75.9%
Boron Injection Tank	1 (116" to 0" clockwise)	SI-TK-2	84.9%
Boron Injection Tank	1 (0 to 116" clockwise)	SI-TK-2	89.5%
Boron Injection Tank	3 (Inlet Nozzle Weld)	SI-TK-2	39.0%
Boron Injection Tank	4 (Outlet Nozzle Weld)	SI-TK-2	31.0%

The staff determined that complete examination of these welds was restricted by weld joint configuration and component geometry. These restrictions limit access and make the Code-required examinations impractical for these welds. To meet the Code requirements, design modifications would be necessary to provide access for complete examination. Imposition of the Code requirements would be a significant burden on the licensee.

The licensee has scanned the welds on the above components with ultrasonic transducers and attempted to optimize the volume scanned. The licensee's best-effort examinations have resulted in volumetric coverage ranging from 31% to 89.5%. The staff finds that the extent of examinations performed on the subject welds would detect any significant patterns of degradation, if they existed. In addition, the subject welds are required to receive the applicable system pressure with a VT-2 visual examination in accordance with the requirements of IWA and IWC-5000. Consequently, the limited volumetric examination and the system pressure test with a VT-2 visual examination of each weld will provide reasonable assurance of the continued structural integrity of the welds. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for relief request NDE-048.

4.0 CONCLUSION

The staff evaluated the licensee's submittal and concluded that certain inservice examinations cannot be performed to the extent required by the Code at North Anna Power Station, Unit 1. The staff concludes that for relief request numbers NDE-047 and NDE-048, the examinations are impractical to perform to the extent required by the Code, and the licensee's proposed alternatives provide reasonable assurance of structural integrity of the subject welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for relief request numbers NDE-047 and NDE-048.

5.0 REFERENCES

1. Letter, February 11, 1999, L. N. Hartz, VEPCO, to USNRC, Virginia Electric and Power Company, Surry Power Station, Units 1 and 2, North Anna Power Station, Units 1 and 2, ASME Section XI Relief Requests

2. Subsection IWL " Requirements for Class CC Concrete Components of Light-Water Cooled Plants" of the 1992 Edition, 1992 Addenda of Section XI, Division 1, of ASME Boiler and Pressure Vessel Code (ASME Code)

Principal Contributor: A. Keim

Date: February 15, 2000

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