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TECHNICAL EVALUATION REPORT ON THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM AND PLAN: VIRGINIA ELECTRIC AND POWER COMPANY, NORTH ANNA POWER STATION, UNIT 1, DOCKET NUMBER 50-338

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ABSTRACT

This report presents the results of the evaluation of the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program, Revision 2, and Plan, Revision 1, submitted May 31, 1991, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the Licensee has determined to be impractical. The North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program Plan is evaluated in Section 2 of this report for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous reviews by the Nuclear Regulatory Commission (NRC). The requests for relief are evaluated in Section 3 of this report.

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SUMMARY

The Licensee, Virginia Electric and Power Company, has prepared the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program, Revision 2, and Plan, Revision 1, to meet the requirements of the 1983 Edition, Summer 1983 Addenda of the ASME Code Section XI except that Class 2 carbon steel piping welds have been selected based on the requirements of the 1974 Edition, Summer 1975 Addenda as allowed by 10 CFR 50.55a(b)(2)(iv)(B) and Class 2 stainless steel piping welds have been selected based on the requirements of ASME Code Case N-408 as allowed by NRC Regulatory Guide 1.147. The second 10-year interval began December 24, 1988 and ends December 24, 1998.

The information in the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 1, dated November 21, 1990 and Plan, Revision 0, dated December 10, 1990, was reviewed. Included in the review were the requests for relief from the ASME Code Section XI requirements that the Licensee has determined to be impractical. As a result of this review, a request for additional information (RAI) was prepared describing the information and/or clarification required from the Licensee in order to complete the review. In a submittal dated May 31, 1991, the Licensee provided the requested information and Revision 2 to the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program and Revision 1 to the Plan. As a result of an October 29, 1991 conference call, the Licensee withdrew Relief Request NDE-16 and submitted Relief Request NDE-17.

Based on the review of the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 2, and Plan, Revision 1, the Licensee's response to the Nuclear Regulatory Commission's RAI, and the recommendations for granting relief from the ISI examination requirements that have been determined to be impractical, it is concluded that the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 2, and Plan, Revision 1 is acceptable and in compliance with 10 CFR 50.55a(g)(4).

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1. INTRODUCTION

Throughout the service life of a water-cooled nuclear power facility, 10 CFR 50.55a(g)(4) (Reference 1) requires that components (including supports) that are classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, Class 2, and Class 3 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" (Reference 2), to the extent practical within the limitations of design, geometry, and materials of construction of the components. This section of the regulations also requires that inservice examinations of components and system pressure tests conducted during successive 120-month inspection intervals comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet requirements set forth in subsequent editions and addenda of this Code that are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein. The Licensee, Virginia Electric and Power Company, has prepared the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program, Revision 2, and Plan, Revision 1, to meet the requirements of the 1983 Edition, Summer 1983 Addenda of the ASME Code Section XI except that Class 2 carbon steel piping welds have been selected based on the requirements of the 1974 Edition, Summer 1975 Addenda as allowed by 10 CFR 50.55a(b)(2)(iv)(B) and Class 2 stainless steel piping welds have been selected based on the requirements of ASME Code Case N-408 as allowed by NRC Regulatory Guide 1.147 (Reference 3). The second 10-year interval began December 24, 1988 and ends December 24, 1998.

As required by 10 CFR 50.55a(g)(5), if the licensee determines that certain Code examination requirements are impractical and requests relief from them, the licensee shall submit information and justifications to the Nuclear Regulatory Commission (NRC) to support that determination. Pursuant to 10 CFR 50.55a(g)(6), the NRC will evaluate the licensee's determinations that Code requirements are impractical; alternatively, pursuant to 10 CFR 50.55a(a)(3), the licensee must demonstrate that either (i) the proposed alternatives would provide an acceptable level of quality and safety or that (ii) code compliance would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. The NRC 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 on the facility.

The information in the North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program, Revision 1 (Reference 4), dated November 21, 1990, and Plan, Revision 0 (Reference 5), dated December 10, 1990, was reviewed, including the requests for relief from the ASME Code Section XI requirements that the Licensee has determined to be impractical. The review of the ISI Program Plan was performed using the Standard Review Plans of NUREG-0800 (Reference 6), Section 5.2.4, "Reactor Coolant Boundary Inservice Inspections and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components."

In a letter dated April 11, 1991 (Reference 7), the NRC requested additional information that was required in order to complete the review of the ISI Program Plan. The requested information was provided by the Licensee in a letter dated May 31, 1991 (Reference 8). Included in the submittal were the North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program, Revision 2 (Reference 9), and Plan, Revision 1 (Reference 10) both dated May 1991. As a result of telephone conversations with the Licensee on October 28 and 29, 1991, Relief Request NDE-16 was withdrawn and Relief Request NDE-17 was submitted by the Licensee on November 27, 1991 (Reference 11).

The North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program and Plan are evaluated in Section 2 of this report for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous reviews.

The requests for relief are evaluated in Section 3 of this report. Unless otherwise stated, references to the Code refer to the ASME Code, Section XI, 1983 Edition, Summer 1983 Addenda. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

This evaluation consisted of a review of the applicable program documents to determine whether or not they are in compliance with the Code requirements and any license conditions pertinent to ISI activities. This section describes the submittals reviewed and the results of the review.

2.1 Documents Evaluated

Review has been completed on the following information provided by the Licensee:

(a) North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program, Revision 1, dated November 21, 1990 (Reference 4);

(b) North Anna Power Station, Unit 1, Second 10-Year Interval ISI Plan, Revision 0, dated December 10, 1990 (Reference 5);

(c) North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program, Revision 2, dated May, 1991 (Reference 9);

(d) North Anna Power Station, Unit 1, Second 10-Year Interval ISI Plan, Revision 1, dated May, 1990 (Reference 10);

(e) Letter, dated May 31, 1991, containing additional information on the Inservice Inspection Program (Reference 8).

(f) Letter, dated November 27, 1991, regarding relief requests for steam generator and pressurizer nozzles for North Anna, Units 1 and 2 (Reference 11).

2.2 Compliance with Code Requirements

2.2.1 Compliance with Applicable Code Editions

The Inservice Inspection Program Plan shall be based on the Code editions defined in 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(b). The

Code applicable to the Second 10-Year Inspection Interval ISI Program, based on the starting date of December 24, 1988, is the 1983 Edition, Summer 1983 Addenda. As stated in Section 1 of this report, the Licensee has written the North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program, Revision 2, and Plan, Revision 1, to meet the requirements of the 1983 Edition, Summer 1983 Addenda of the ASME Code Section XI except that Class 2 carbon steel piping welds have been selected based on the requirements of the 1974 Edition, Summer 1975 Addenda as allowed by 10 CFR 50.55a(b)(2)(iv)(B) and Class 2 stainless steel piping welds have been selected based on the requirements of ASME Code Case N-408 as allowed by NRC Regulatory Guide 1.147. The second 10-year interval ends December 24, 1998.

2.2.2 Acceptability of the Examination Sample

Inservice volumetric, surface, and visual examinations shall be performed on ASME Code Class 1, 2, and 3 components and their supports using sampling schedules described in Section XI of the ASME Code and 10 CFR 50.55a(b).

The NRC and ASME Code Case N-408 require that 7.5% of the welds in the RHR, ECC, and CHR systems, which only require a surface examination by Section XI of the Code, be volumetrically examined once each 10-year interval. Review of the ISI program documents shows that the Licensee has committed to perform an ultrasonic examination on a minimum of 7.5% of the required welds in these engineered safety systems. These added welds are mostly thin-walled or small-diameter piping that Section XI exempts or excludes from volumetric weld examinations based on size, wall thickness, pressure, or temperature.

Based on the above mentioned commitment, the sample size and weld selection have been implemented in accordance with the Code and appear to be correct.

2.2.3 Exclusion Criteria

The criteria used to exempt components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exemption criteria have been applied by the Licensee in accordance with the Code as discussed in the ISI Program and appear to be correct. It is noted that the exemption criteria for Class 2 components have been upgraded to include recommendations of Code Case N-408, "Alternative Rules for Examination of Class 2 Piping." The Licensee has committed to volumetrically examine a minimum of 7.5% of the Class 2 piping welds in the engineered safety systems, including the RHR, ECC, and CHR systems, using the exemption criteria contained in Code Case N-408.

2.2.4 Augmented Examination Commitments

The Licensee has committed to performing the following augmented examinations during the second 10-year inspection interval:

(a) Volumetric examination of the reactor coolant pump flywheel will be performed in place at approximately 3 year intervals and volumetric and surface examinations will be performed with the flywheel removed at 10 year intervals per Technical Specification 4.4.10.1.1 and NRC Regulatory Guide 1.14, Revision 1 (Reference 12).

(b) Volumetric and surface examinations of every weld on the reactor coolant loop bypass lines will be performed every 40 months.

(c) Volumetric and surface examinations of selected welds in the pressurizer spray piping in the lower cubicle between floor elevations 262 ft. 10 in. and 272 ft. 6 in. will be performed every 40 months.

(d) Volumetric and surface examinations of 1/3 of the selected welds on the main steam postulated break locations will be

performed every 40 months, with 100% of all welds completed by the end of the interval.

(e) Volumetric and surface examination of 1/3 of the selected welds in the feedwater postulated break locations will be performed every 40 months, with 100% of all welds completed by the end of the interval.

(f) A VT-1 visual examination of the steam generator supports (1/3 of the main member welds joining A572 material) will be performed every 40 months.

(g) Radiographic examination of a selected group of Rockwell Edwards T-58 angle univalves will be performed every 18 months.

(h) Semi-annual wall thickness measurements will be performed on service water pipes.

(i) A 100% eddy current examination will be performed on all reactor vessel in-core detector thimble tubes that are in service during each refueling outage.

(j) Radiographic examination of the reactor coolant piping thermal sleeves will be performed every third refueling outage.

(h) Reactor vessel examinations will be performed in accordance with NRC Regulatory Guide 1.150, Revision 1 (Reference 13).

2.3 Conclusions

Based on the review of the documents listed above, it is concluded that the North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program, Revision 2, and Plan, Revision 1, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements that the Licensee has determined to be impractical for the second 10-year inspection interval are evaluated in the following sections.

3.1 Class 1 Components

3.1.1 Reactor Pressure Vessel

3.1.1.1 Request for Relief NDE-3, Examination Category B-G-1, Item B6.40, Reactor Pressure Vessel Flange Threads

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-G-1, Item B6.40 requires a 100% volumetric examination of the threads in the reactor pressure vessel (RPV) flange as defined by Figure IWB-2500-12. Table IWB-2412-1, Inspection Program B, requires a minimum of 16% of examinations be completed with a maximum of 34% of examinations credited during the first inspection period, a minimum of 50% of examinations be completed with a maximum of 67% of examinations credited during the second inspection period, and a minimum of 100% of examinations be completed with a maximum of 100% of examinations credited during the third inspection period of the second inspection interval.

Licensee's Code Relief Request: Relief is requested from the examination scheduling requirements specified in Table IWB-2412-1 for the examination of the threads in the reactor vessel flange.

Licensee's Proposed Alternative Examination: An automated ultrasonic examination shall be performed on 50% of the threads in the flange during the first period reactor vessel examination and the remaining 50% of the threads in the flange during the end-of-interval reactor vessel examination.

Licensee's Basis for Requesting Relief: Relief from the examination scheduling requirements is requested based upon the following criteria:

(a) Virginia Electric and Power Company currently schedules the reactor vessel flange threads examination to be performed in concurrence with the automated examination performed on the reactor vessel welds. This permits the examinations to be conducted with more sophisticated (i.e., digital, automated) ultrasonic techniques in lieu of manual techniques.

(b) In order to accommodate the automated ultrasonic calibrations, the calibration block is currently being maintained by the reactor vessel-ISI contractor at their facility. To examine the percentage of threads in the flange specified in the second period by Table IWB-2412-1, it would be necessary to either schedule an automated ultrasonic examination solely to examine these threads or to fabricate a calibration block to perform manual ultrasonic examinations. Virginia Electric and Power Company does not believe that the cost of an additional automated examination is justified or that a manual examination would be as reliable as an automated examination for these threads.

Evaluation: The Code allows deferral of examinations of the reactor pressure vessel welds to the end of the inspection interval. As stated by the Licensee, the only volumetric examinations that would be performed on the reactor vessel with the reactor vessel inspection tool during the second inspection period would be of the threads in the reactor vessel flange. Since all of the threads in the reactor vessel flange will be examined during the inspection interval, the intent of the Code will be met. Therefore, the Licensee's proposed alternative scheduling provides an acceptable level of quality and safety. Code compliance would result in hardship or unusual difficulty without a compensating increase in safety.

Conclusions: It is concluded that public health and safety will not be endangered by allowing the Licensee's proposed scheduling of volumetric examinations of the threads in the reactor vessel flange in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that relief be granted as requested.

3.1.1.2 Request for Relief NDE-14, Subarticle IWA-2600, Weld Reference System for Reactor Pressure Vessel Welds

Code Requirement: Section XI, Subarticle IWA-2600 requires that a reference system be established for all welds and areas subject to surface or volumetric examination. Each such weld and area shall be located and identified by a system of reference points. The system shall permit identification of each weld, location of each weld center line, and designation of regular intervals along the length of the weld.

Licensee's Code Relief Request: Relief is requested from establishing a weld reference system, as required by IWA-2600, for the pressure retaining welds in the reactor vessel and vessel nozzle area examined by the automated vessel tool inspection device.

Licensee's Proposed Alternative Examination: None. The automated vessel tool examinations will continue to establish its reference system based upon the existing zero reference. No other system is planned or deemed necessary.

Licensee's Basis for Requesting Relief: The automated tool establishes it reference point using an existing zero reference in the reactor vessel. This point allows the device to repeat examination locations without the necessity of any other reference systems. It accomplishes this by the use of an electronic encoder system that provides for sufficient repeatability.

Evaluation: Repeatability is provided by a zero reference point that the automated vessel tool uses to establish its reference point. Therefore, the intent of the Code will be met. The Licensee's proposed alternative reference system for the reactor vessel welds examined with the automated vessel tool provides an acceptable level of quality and safety. Code compliance would result in hardship or unusual difficulty without a compensating increase in safety.

Conclusions: It is concluded that public health and safety will not be endangered by allowing the Licensee's proposed alternative reference system in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that relief be granted as requested.

3.1.1.3 Request for Relief SPT-11, VT-2 Visual Examination of the Reactor Pressure Vessel During System Pressure Tests

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-E, Item B4.13 requires a 100% VT-2 visual examination of the reactor pressure vessel instrumentation nozzle partial penetration welds performed during the system hydrostatic test of IWB-5222.

Examination Category B-P, Items B15.10 and B15.11 require a 100% VT-2 visual examination of the reactor pressure vessel pressure retaining boundary during the system leakage test (IWB-5221) and the system hydrostatic test (IWB-5222), respectively.

Licensee's Code Relief Request: Relief is requested from performing the Code-required VT-2 visual examinations of the reactor pressure vessel instrumentation nozzle partial penetration welds and the bottom of the reactor pressure vessel during the system leakage test and system hydrostatic test.

Licensee's Proposed Alternative Examination: Technical Specifications require that the reactor coolant system leak rate be limited to 1 gallon per minute for unidentified leakage. This value is calculated at least once per 72 hours. Additionally, the containment atmosphere particulate radioactivity is monitored every 12 hours. The in-core sump room has a level alarm in the control room requiring operator action. These actions would identify any integrity concerns associated with this area. A VT-2 examination will be conducted each refueling, when containment is at atmospheric conditions, for evidence of boric acid corrosion.

Licensee's Basis for Requesting Relief: In order to meet the Section XI pressure and temperature requirements for the system leakage and system hydrostatic tests of the reactor vessel, reactor containment at North Anna, Unit 1, is required to be at a subatmospheric pressure. Station administrative procedures require that self-contained breathing apparatus be worn for containment entries under these conditions. This requirement significantly complicates the visual (VT-2) examination of the bottom of the reactor vessel during testing. Access to the bottom of the reactor vessel requires that the examiner descend several levels by ladder and navigate a small entrance leading to the reactor vessel. In addition to these physical constraints, the examiner must contend with extreme environmental conditions: elevated air temperatures due to reactor coolant at temperatures above 500°F and limited air circulation in the vessel cubicle. In addition, the examiner is limited to the approximate 30 minute capacity of the breathing apparatus for containment entry, the VT-2 visual examination, and containment exit.

Evaluation: The design is such that a VT-2 visual examination of the bottom of the reactor vessel is impractical when the containment is subatmospheric during the system leakage and system hydrostatic tests. Extensive modifications would be required in order to meet the Code requirement. The increase in safety would not compensate for the burden placed on the Licensee

that would result from imposition of the requirement. Although the bottom side of the vessel is inaccessible during pressure tests, the Licensee has committed to performing a VT-2 visual examination of the area at atmospheric conditions each refueling for evidence of boric acid corrosion. Therefore, reasonable assurance of the continued inservice structural integrity is provided and public safety is not jeopardized.

Conclusions: The VT-2 visual examination required by Section XI of the ASME Code for the bottom side of the reactor vessel is impractical to perform because the containment is subatmospheric and essentially inaccessible. Imposition of the requirement on Virginia Electric and Power Company would cause a burden and would create a personnel hazard that would not be compensated significantly by an increase in safety above that provided by the proposed examination. The proposed examination will provide reasonable assurance that the structural integrity of the reactor vessel is maintained. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.2 Pressurizer

3.1.2.1 Request for Relief NDE-1, Examination Category B-D, Item B3.110, Pressurizer Nozzle-to-Vessel Weld

NOTE: In the May 31, 1991 response to the NRC request for additional information, the Licensee withdrew Relief Request NDE-1. Virginia Electric and Power Company is pursuing detailed drawings that depict the surge line nozzle with respect to the location of the heater penetrations. These drawings are needed to accurately determine the extent of examination possible for the surge line nozzle-to-vessel weld.

3.1.2.2 Request for Relief NDE-2 (Part 1 of 3), Examination Category B-D, Item B3.120, Pressurizer Nozzle Inner Radius Sections

NOTE: In the May 31, 1991 response to NRC request for additional information, the Licensee withdrew Relief Request NDE-2 based on an evaluation of an alternative ultrasonic examination technique for the five pressurizer upper head nozzle inside radius sections developed under the provisions of IWA-2240. This relief request is superseded by Relief Request NDE-16.

3.1.2.3 Request for Relief NDE-16, Examination Category B-D, Item B3.120, Pressurizer Nozzle Inner Radius Sections

NOTE: In a letter to the NRC dated November 27, 1991, the Licensee withdrew Relief Request NDE-16. This relief request is superseded by Relief Request NDE-17.

3.1.2.4 Request for Relief NDE-17, Examination Category B-D, Items B3.110 and B3.120, Pressurizer Surge Line Nozzle

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Items B3.110 and B3.120 require 100% volumetric examination of the pressurizer surge line nozzle-to-vessel welds and the nozzle inside radius as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of Pressurizer Surge Line Nozzle-to-Vessel Weld No. 9 and Inner Radius Section 9NIR on Pressurizer 1-RC-E-2.

Licensee's Basis for Requesting Relief: The Licensee states that the North Anna, Unit 1 pressurizer surge nozzle is surrounded by 78 heater penetrations. Engineering recommends that the heater cables be disconnected prior to the removal of insulation. This recommendation is due to the possibility of damage to the heater

element connections if the insulation is removed while the cables are connected.

Based upon the most recent survey of the applicable area, the dose rate is 500 mR in the general area, 900 mR at one foot, and 3000 to 3500 mR contact. Based upon estimates provided by site Electrical Maintenance, Insulation Removal, and ISI/NDE, it would require ten man hours to disconnect and reconnect the heater cables, four man hours to remove and reinstall the reflective insulation and seven man hours to prepare and examine the nozzle-to-vessel weld and nozzle inside radius section. The resulting dose estimate for these examinations is 15.8 man rem.

Based upon a review of the fabrication drawings, the estimated percentage of the required volume that could be examined on the pressurizer surge line nozzle-to-vessel weld (9) is as follows:

EXAMINATION ANGLE	PERCENTAGE EXAMINED
45 Degrees	60%
60 Degrees	40%
0 Degrees	30%

The examination coverage of the nozzle inside radius section (9NIR) would be somewhat larger values, however the Licensee feels that the confined access to the nozzle as a result of the pressurizer skirt, surge line piping and heater penetrations, and area dose rates would result in only a "best effort" examination in either case. Therefore, it is felt that the gain in system integrity is not commensurate with the exposure received from the examinations.

Licensee's Proposed Alternative Examination: None. A visual (VT-2) examination of the pressurizer surge line nozzle-to-vessel weld will be performed during the normally scheduled system leakage test each refueling. In addition, Technical Specifications requires that the Reactor Coolant System Leak Rate be limited to one gallon per minute unidentified leakage. This

value is calculated at least once per 72 hours. Additionally, the containment atmosphere particulate radioactivity is monitored every 12 hours. No additional alternative requirements are deemed necessary.

Evaluation: The pressurizer lower head design incorporates penetrations for heaters. The location of these heater penetrations limits the volumetric examination of the surge nozzle-to-vessel weld and the associated inside radius section. The lower head design, therefore, makes a 100% volumetric examination impractical to perform. The Licensee has estimated the percentage of the required volume that could be examined, but does not feel the limited examination is commensurate with the personnel exposure that would be received. In order to examine the weld and inside radius section in accordance with the requirements, the pressurizer lower head, and thus the pressurizer, would require extensive modifications. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

Conclusions: It is concluded that the volumetric examination required by Section XI, for the pressurizer surge line nozzle-to-vessel weld and the associated inside radius section, would result in a hardship at North Anna, Unit 1 due to the ALARA considerations. The public health and safety will not be endangered by allowing the visual examination of the weld during the normally scheduled system leakage test to be performed in lieu of the required volumetric examination. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.3 Heat Exchangers and Steam Generators

3.1.3.1 Request for Relief NDE-2 (Part 2 of 3), Examination Category B-D, Item B3.140 Steam Generator Nozzle Inside Radius Sections

NOTE: In the May 31, 1991 response to NRC request for additional information, the Licensee withdrew Relief Request NDE-2 based on an evaluation of an alternative ultrasonic examination technique for the Class 2 nozzle inner radius sections developed under the provisions of IWA-2240. This relief request is superseded by Relief Request NDE-15.

3.1.3.2 Request for Relief NDE-15, Examination Category B-D, Item B3.140, Steam Generator Nozzle Inside Radius Sections

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.140 requires a 100% volumetric examination of the steam generator (primary side) nozzle inside radius sections as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of nozzle inner radius sections 11NIR and 12NIR of steam generators A, B, and C.

Licensee's Proposed Alternative Examination: As an alternative to the Code-required volumetric examination of the Steam Generator's six Category B-D nozzle inside radius sections (11NIR and 12NIR on 1-RC-E-1A, -1B, and -1C), the areas will be visually examined (VT-1) from the nozzle inside surface using direct or remote techniques per the schedule shown in Table IWB-2412-1, Inspection Program B, up until the time that the Steam Generators are replaced.

Licensee's Basis for Requesting Relief: The Licensee states that the only viable ultrasonic technique currently available to examine nozzle inner radii involves the fabrication of

calibration blocks that closely simulate the O.D. and I.D. nozzle geometry. This is necessary so that search units can be produced that will interrogate the inner radius section at precise angles. Also, in order to obtain meaningful results, the nozzle material grain structure must be such that an adequate signal-to-noise ratio can be obtained over a long metal path distance. For nozzles with a complex O.D. profile, examination personnel need training on the proper placement and manipulation of the search unit.

The Class 1 nozzles on the North Anna, Unit 1 Steam Generators are integrally cast into the channel head. Therefore, the nozzles contain examination limitations such as an irregular O.D. profile, rough surface condition, and attenuating grain structure. Due to the above, the Licensee believes that a full scale mock-up of the nozzle would be necessary to develop a viable inner radius technique and to provide adequate training for examination personnel.

The Licensee concludes that the Unit 1 Steam Generators are scheduled to be replaced in the second period of Interval 2 with generators that contain forged channel heads. Calibration blocks have been ordered to facilitate examination of the replacement generator channel head nozzle inner radii.

Evaluation: The steam generator nozzle sections at North Anna, Unit 1, were not designed for external examination of the inside radius using ultrasonic methods. The component geometry and the as-cast surface, along with the excessively long metal path that results in high ultrasonic attenuation, preclude volumetric examination of the nozzle inside radius sections from the external surface. The steam generator nozzle design, therefore, makes the Code-required examination impractical to perform. In order to examine the nozzle inside radius sections in accordance with the requirement, the Steam Generator Nozzles, and thus the Steam Generator, would have to be redesigned, fabricated, and installed. The Licensee states that the Steam Generators are

scheduled to be replaced in the second period of Interval 2. Imposition of the requirement on Virginia Electric and Power Company prior to scheduled replacement would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Licensee has committed to perform a VT-1 visual examination of the nozzle inside radius sections from the inside surface using direct or remote techniques. This examination will provide adequate assurance that unallowable inservice flaws have not developed or that they will be detected and removed or repaired prior to the return of the Steam Generators to service.

Conclusions: It is concluded that the Code-required volumetric examination of the steam generator nozzle inside radius sections is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the alternative examination to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.1.4 Piping Pressure Boundary

3.1.4.1 Request for Relief NDE-4, Selection of Class 1 Piping Welds for Examination

Code Requirement: Section XI of the ASME Code, 1983 Edition, Summer 1983 Addenda, requires that Notes 1(b) and 2 of Examination Category B-J, Table IWB-2500-1, be used in the selection of Class 1 piping welds for examination.

Note 1(b) states that examinations shall include all terminal ends and joints in each pipe or branch run connected to other components where the stress levels exceed the following limits under loads associated with specific seismic events and operational conditions:

(1) primary plus secondary stress intensity range of $2.4S_m$ for ferritic steel and austenitic steel

(2) cumulative usage factor, U, of 0.4.

Note 2 states that the initially selected welds shall be reexamined during each inspection interval.

Licensee's Code Relief Request: Relief is requested from using Notes 1(b) and 2 of Examination Category B-J, Table IWB-2500-1 for the selection of Class 1 piping welds for examination.

Licensee's Proposed Alternative Examination: ISI Class 1 piping welds will be selected for examination such that 25% of the total number of welds are examined during the interval. The 25% sampling will include terminal ends as they appear on plant isometrics as no corresponding stress calculations exist. The welds selected will be evenly distributed based upon line size, line function, and line design to the extent practicable. These selected welds will be examined in future successive inspection intervals to the extent allowed by Code editions approved at that time.

Licensee's Basis for Requesting Relief: The first interval selection was based upon the 1974 Edition with Summer 1975 Addenda of the ASME Code, Section XI. As a result, Notes 1(b) and 2 cannot be applied without some programmatic additions and modifications. In addition, although stress and utilization calculations exist for North Anna, Unit 1, no correlation exists with actual weld locations. Total reuse of the first interval plan is not desirable, since the distribution of welds selected to meet 1974 Edition, Summer 1975 Addenda requirements did not equitably cover certain line functions and designs.

Evaluation: Paragraph 2.1.2 of the North Anna Power Station, Unit 1, Second 10-Year ISI Program states, "The welds selected include all terminal ends and branch connections." This

commitment eliminates the need to perform the stress calculations required in the selection criteria for Class 1 piping welds found in Note 1(b). Note 2 requires reexamination of welds inspected during the first interval. Since the first interval sample was selected based on the 74 Edition, Summer 75 Addenda, the selection criteria did not include all of the terminal ends and branch connections. Therefore, reexamination of welds selected during the first interval is not applicable.

Conclusions: The stress calculations for terminal end welds of Note 1(b) become unnecessary because Virginia Electric and Power Company committed to include all terminal ends and branch connections in the 25% sample for the interval. The changes in selection criteria from 74 Edition, Summer 75 Addenda to 83 Edition, Summer 83 Addenda make the requirement of Note 2, to reexamine initially selected welds, nonapplicable. It is concluded that the proposed alternative selection criteria in lieu of Notes 1(b) and 2 would provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that relief be granted as requested.

3.1.5 Pump Pressure Boundary

3.1.5.1 Request for Relief NDE-5, Examination Categories B-L-1 and B-L-2, Items B12.10 and B12.20, Class 1 Pump Casing Welds and Internal Surfaces

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-L-1, Item B12.10 requires a 100% volumetric examination of the Class 1 pump casing welds, as defined by Figure IWB-2500-16, in at least one pump in each group of pumps performing similar functions in the system. Examination Category B-L-2, Item B12.20 requires a 100% VT-3 visual examination of the internal surfaces of one Class 1 pump casing in each group of pumps performing similar functions.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric and visual examinations of the Class 1 pump casing weld and internal surfaces, respectively, of reactor coolant pumps 1-RC-P-1A, -1B, and -1C.

Licensee's Proposed Alternative Examination: The Licensee states that a visual examination of the external surfaces of one pump's casing weld and a surface examination of the weld to the extent practical of the external casing weld of one pump will be performed to the extent and frequency of Category B-L-2 in lieu of the required Section XI examinations.

Licensee's Basis for Requesting Relief: Pump Casing Weld: Two of the North Anna Power Station, Unit 1, reactor coolant pumps are Westinghouse Model 93 controlled leakage pumps. The Model 93 pump casing is fabricated by welding two stainless steel castings together. Thus, there is one circumferential pressure boundary weld in the casing that is to be examined in accordance with Category B-L-1.

Since the installation of these pumps, it has been recognized that a volumetric examination of the casing welds is not practical when employing current ultrasonic techniques. The physical properties of the stainless steel casting and weld material preclude a meaningful ultrasonic examination. The capability to examine these pump casing welds in the field did not exist until recently. In the spring of 1981, a radiographic examination was performed on one of the reactor coolant pumps at the R. E. Ginna plant using the miniature linear accelerator (MINAC), which was built under an EPRI sponsored program. This equipment has been made available to other utilities, and currently constitutes the only viable volumetric examination method for reactor coolant pump welds. The examination is performed by placing the MINAC inside the pump casing and placing film on the outside of the pump. To perform the examination, the pump must be completely disassembled, including removal of the diffuser adapter. The required disassembly is far beyond that

performed for normal maintenance. Insulation must also be removed from the exterior of the pump casing.

The examination has been performed at four different sites, all of which have the Westinghouse Model 5[illegible] pump. The MINAC examination was performed at Ginna in the spring of 1981, at Point Beach, Unit 1, in the fall of 1981, at Turkey Point, Unit 3, early in 1982, and at H. B. Robinson, Unit 2, later in 1982. No problems with the welds were found at any of the sites. A review of the original radiographs of the Point Beach, Unit 1, pump was performed prior to the MINAC examination, and all the landmarks were identified during field examination and had no apparent change.

The successful performance of this volumetric examination using the MINAC at four different sites demonstrates that the method is capable of satisfying ASME Section XI examination requirements. However, the performance of the examination has shown that there is a relatively high associated radiation exposure. The total exposure associated with insulation removal, disassembly, examination, and reassembly of the pump has averaged about 40 manrem per pump.

There have been no defects identified by the four successful examinations performed on these pumps to date. Several unsuccessful attempts have been made to examine these welds at Virginia Power's reactors; a volumetric examination was attempted at North Anna in 1982. A radioactive source was placed within the pump casing and film around the outside. The developed film did not meet the density requirements for an acceptable examination. This examination was attempted twice at Surry. Both examinations yielded similar results.

Pump Casing: The pump casing examinations are also not justified from a cost/benefit perspective. The pump disassembly, examination, and reassembly is estimated to cost $750,000.

Evaluation: The examination requirement for internal surfaces of pumps necessitates complete disassembly of the pump. The disassembly of the reactor c[illegible]t pumps for the sole purpose of visual examination of the casi[illegible]nternal surfaces and volumetric examination of the pump casing weld is a major effort and requires many manhours from skilled maintenance and inspection personnel. In addition to the possibility of damage to the pump, personnel would receive excessive radiation exposure. Therefore, the Code requirement is impractical. The visual examination is performed to determine if unanticipated degradation of the casing is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous examinations of similar pumps at other plants has not shown any significant degradation of pump casings. Imposition of the requirements on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

Virginia Electric and Power Company's proposed alternative is to perform a visual and a surface examination of the selected pump casing weld outside surface. The Licensee should also perform a VT-3 visual examination of the internal surfaces of the pumps whenever the internal surfaces are accessible due to disassembly for maintenance.

Later editions and addenda of the ASME Code (1988 Addenda) have eliminated disassembly of pumps for the sole purpose of performing examinations of the internal surfaces and state that the internal surface visual examination requirement is only applicable to pumps that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the pump casing, if the pump is disassembled for maintenance, is acceptable. Since no major problems have been reported in the industry with regard to pump casings, the Licensee's proposal will provide adequate assurance of the continued inservice structural integrity.

Conclusions: It is concluded that the disassembly of a pump for the sole purpose of inspections required by Section XI of the ASME Code is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed examination to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted provided that if the pump has not been disassembled, this fact should be reported by the Licensee in the ISI Summary Report at the end of the interval.

3.1.6 Valve Pressure Boundary

3.1.6.1 Request for Relief NDE-6, Examination Category B-M-2, Item B12.50, Class 1 Valve Bodies

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-M-2, Item B12.50 requires a 100% VT-3 visual examination of the internal surfaces of one Class 1 valve in each group of valves that are of the same construction, design and manufacturing method, and that perform similar functions in the system.

Licensee's Code Relief Request: Relief is requested from disassembling a valve for the sole purpose of performing the Code-required VT-3 visual examination.

Licensee's Proposed Alternative Examination: Visual examination of the internal pressure boundary surfaces will be performed, to the extent practical, when a valve is disassembled for maintenance purposes.

Licensee's Basis for Requesting Relief: The requirement to disassemble primary system valves for the sole purpose of performing a visual examination of the internal pressure boundary surfaces has a very small potential of increasing plant safety

margins and a very disproportionate impact on expenditures of plant manpower and radiation exposure.

The ISI Class 1 systems at North Anna, Unit 1, include valves which vary in size, design, and manufacturer, but all are produced from either cast stainless steel or cast carbon steel. None of the valve bodies are welded.

The performance of both carbon and stainless cast valve bodies has been excellent in pressurized water reactor (PWR) applications. Based on this experience, and both industry and regulatory acceptance of these alloys, continued excellent service performance is anticipated.

A more practical approach is to examine the internal pressure boundary of only those valves that require disassembly for maintenance purposes. This would significantly reduce radiation exposure to plant personnel.

Evaluation: The examination requirement for internal surfaces of valve bodies necessitates complete disassembly of the valve. Disassembly of the subject valves for the sole purpose of visual examination of the valve body internal surfaces is a major effort and requires many manhours from skilled maintenance and inspection personnel. In addition to the possibility of damage to the valve, personnel could receive excessive radiation exposure. Therefore, the Code requirement is impractical. The visual examination is performed to determine if unanticipated degradation of the valve body is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous examinations of similar valves at other plants has not shown any significant degradation of valve bodies. Imposition of the requirements on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed examination.

Virginia Electric and Power Company has stated that the Code-required visual examination will be performed on the internal pressure boundary surface when valve disassembly is required for maintenance.

Later editions and addenda of the ASME Code (1988 Addenda) have eliminated disassembly of valves for the sole purpose of performing examinations of the internal surfaces and state that the internal surface visual examination requirement is only applicable to valves that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the valve body, when the valve is disassembled for maintenance, is acceptable. Since no major problems have been reported in the industry with regard to valve bodies, the Licensee's proposal will provide adequate assurance of the continued inservice structural integrity.

Conclusions: It is concluded that the disassembly of a valve for the sole purpose of inspection is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed examination to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted provided that, if the valve has not been disassembled, this fact should be reported by the Licensee in the ISI Summary Report at the end of the interval.

3.1.7 General (No relief requests)

3.2 Class 2 Components

3.2.1 Pressure Vessels

3.2.1.1 Request for Relief NDE-2 (Part 3 of 3), Examination Category C-B, Item C2.22, Class 2 Steam Generator Nozzle Inside Radius Sections

NOTE: In the May 31, 1991 response to the NRC's request for additional information, the Licensee withdrew Relief Request NDE-2 based on an evaluation of an alternative ultrasonic examination technique developed under the provisions of IWA-2240.

3.2.2 Piping

3.2.2.1 Request for Relief NDE-7, Examination Category C-F, Item C5.31, Class 2 Main Steam Relief Header Branch Connection Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-F, Item C5.31 requires a 100% surface examination of the Class 2 pipe branch connection circumferential welds as defined by Figures IWC-2500-9 to -13, inclusive.

Licensee's Code Relief Request: Relief is requested from performing the Code-required surface examination of the following Class 2 pipe branch connection circumferential welds:

Weld Numbers	Drawing Numbers
SW-52 to SW-56	11715-WMKS-101A-1
SW-15 to SW-17 and SW-40W to SW-41W	11715-WMKS-101A-2
SW-32W to SW-35W and SW-18W	11715-WMKS-101A-3

Licensee's Proposed Alternative Examination: A surface examination of the reinforcement pad fillet welds associated with one branch connection weld will be performed during the interval.

Licensee's Basis for Requesting Relief: The design of the main steam relief header branch connection welds calls for the use of

a reinforcement pad. These pads are fillet welded and completely encase the branch connection welds.

Evaluation: Section B-B of each of the drawings listed above shows that the subject circumferential pipe branch connection welds are completely covered by a reinforcing pad. The design of these branch connection welds, therefore, makes the Code-required surface examination impractical to perform. In order to examine the weld in accordance with the requirement, the system would require extensive design modifications. Imposition of the requirements on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

Using the criteria of the 1974 Edition through Summer 1975 Addenda for selection of carbon steel piping welds for examination, the Licensee has stated that the reinforcement pad fillet welds associated with one branch connection weld will receive surface examination during this inspection interval. 50% of the branch connection welds on one bank is an acceptable sample size for multiple stream systems, and must be distributed over all three subject streams. This examination will provide adequate assurance that unallowable inservice flaws have not developed in the branch connections or that they will be detected and removed or repaired prior to the return of the system to service.

Conclusions: It is concluded that the surface examination required by Section XI of the ASME Code for the subject pipe branch connection circumferential welds is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative examination to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.3 Pumps

3.2.3.1 Request for Relief NDE-8, Examination Category C-G, Item C6.10, Outside Recirculation Spray Pump Casing Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-G, Item C6.10 requires a 100% surface examination of the Class 2 pump casing welds as defined by Figure IWC-2500-8.

Licensee's Code Relief Request: Relief is requested from performing 100% of the Code-required surface examination of the following pump casing welds of outside recirculation spray pumps 1-RS-P-2A and 1-RS-P-2B:

Drawing Number	Weld Numbers
11715-WMKS-RS-P-2A	SW-1, SW-2, SW-3, LS-6, LS-7, LS-8, LS-9 (Partial access), LS-10 (Partial access)
11715-WMKS-RS-P-2B	SW-1, SW-2, SW-3, LS-6, LS-7, LS-8, LS-9 (Partial access), LS-10 (Partial access)

Licensee's Proposed Alternative Examination: A surface examination of the accessible portions of the circumferential and longitudinal welds will be performed to the extent and frequency described in IWC-2500. A remote visual examination (VT-1) of the inside surface of the pump casing welds will be performed only if the pump is disassembled for maintenance.

Licensee's Basis for Requesting Relief: Each of the two outside recirculation spray pump casings has five circumferential welds and five longitudinal welds. Three of the circumferential welds (SW-1, SW-2, and SW-3) and three of the longitudinal welds (LS-6, LS-7, and LS-8) are completely encased in concrete and are not accessible for examination from the outside surface. Of the remaining two longitudinal welds, one weld is partially encased in concrete (LS-9) and one weld is partially covered by a

vibration plate (LS-10). Partial examinations from the outside surface can be performed on both of these longitudinal welds. The remaining two circumferential welds are completely accessible for examinations from the outside surface. Surface examinations from the inside surface are not a practicable alternative. Access to the inside of the pump casings is limited by physical size (24-inch outside diameter), the pump shaft, and the pump shaft support obstructions.

Evaluation: The drawings listed above show that the subject welds are either completely or partially encased in concrete. The inaccessibility of the welds, therefore, makes the surface examination impractical to perform to the extent required by the Code. Extensive modifications would be required in order to examine the welds in accordance with the requirement. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

Welds LS-9 and LS-10 are the only welds of those welds listed above that are partially accessible for examination. The Licensee's proposed alternative is to perform the surface examination of all accessible portions of the pump casing welds and, if the pump is disassembled for maintenance, a remote visual examination of the interior surface of the pump casing welds. These examinations will provide adequate assurance that unallowable inservice flaws have not developed in the pump casing welds or that they will be detected and removed or repaired prior to the return of the pumps to service.

Conclusions: It is concluded that the surface examination of the subject pump casing welds is impractical to perform at North Anna, Unit 1, to the extent required by the Code and that public health and safety will not be endangered by allowing the proposed alternative examination to be performed in lieu of the Code

requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.3.2 Request for Relief NDE-9, Examination Category C-G, Item C6.10, Low Head Safety Injection Pump Casing Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-G, Item C6.10 requires a 100% surface examination of the Class 2 pump casing welds as defined by Figure IWC-2500-8.

Licensee's Code Relief Request: Relief is requested from performing 100% of the Code-required surface examination of the following pump casing welds of low head safety injection pumps 1-SI-P-1A and 1-SI-P-1B:

Drawing Number	Weld Numbers
11715-WMKS-SI-P-1A	1, 2, 3, LS-1, LS-2, LS-3, LS-4 (Partial access), LS-5 (Partial access)
11715-WMKS-SI-P-1B	1, 2, 3, LS-1, LS-2, LS-3, LS-4 (Partial access), LS-5 (Partial access)

Licensee's Proposed Alternative Examination: A surface examination of the accessible portions of the circumferential and longitudinal welds will be performed to the extent and frequency described in IWC-2500. A remote visual examination (VT-1) of the inside surface of the pump casing welds will be performed only if the pump is disassembled for maintenance.

Licensee's Basis for Requesting Relief: Each of the two low head safety injection pump casings have a total of five circumferential welds and five longitudinal welds. Three of the circumferential welds (1, 2, and 3) and three of the longitudinal welds (LS-1, LS-2, and LS-3) are completely encased in concrete and are not accessible for examination from the outside surface. Of the remaining two longitudinal welds, one weld is partially encased in concrete (LS-4) and one weld is partially covered by a

ibration plate (LS-5). Partial examinations from the outside surface can be performed on both of these longitudinal welds. The remaining two circumferential welds are completely accessible for examinations from the outside surface. Surface examinations from the inside surface are not a practicable alternative. Access to the inside of the pump casings is limited by physical size (24-inch outside diameter), the pump shaft, and the pump shaft supports.

Evaluation: The drawings listed above show that the subject welds are either completely or partially encased in concrete. The inaccessibility of the welds, therefore, makes the surface examination impractical to perform to the extent required by the Code. Extensive modifications would be required in order to examine the welds in accordance with the requirement. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

Welds LS-4 and LS-5 are the only welds of those welds listed above that are partially accessible for examination. The Licensee's proposed alternative is to perform the surface examination of all accessible portions of the pump casing welds and, if the pump is disassembled for maintenance, a remote visual examination of the interior surface of the pump casing welds. These examinations will provide adequate assurance that unallowable inservice flaws have not developed in the pump casing welds or that they will be detected and removed or repaired prior to the return of the pumps to service.

Conclusions: It is concluded that the surface examination of the subject pump casing welds is impractical to perform at North Anna, Unit 1, to the extent required by the Code and that public health and safety will not be endangered by allowing the proposed alternative examination to be performed in lieu of the Code

requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.2.4 Valves (No relief requests)

3.2.5 General (No relief requests)

3.3 Class 3 Components (No relief requests)

3.4 Pressure Tests

3.4.1 Class 1 System Pressure Tests

3.4.1.1 Request for Relief SPT-1 (Part 1 of 2), System Hydrostatic Test of Class 1 Chemical and Volume Control Piping

Code Requirement: Section XI, Subparagraph IWB-5210(a)(2) requires that the Class 1 pressure retaining components receive a system hydrostatic test [IWA-5211(d)] at the frequency stated and visual examination by the method specified in Table IWB-2500-1, Examination Category B-P. Subparagraph IWB-5222(a) states that the system hydrostatic test may be conducted at any test pressure specified in Table IWB-5222-1 corresponding to the selected test temperature, provided the requirements of IWB-5230 are met for all ferritic steel components within the boundary of the system (or portion of system) subject to the test pressure (see IWA-5245).

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic test of the following Class 1 piping in the chemical and volume control system at a pressure of 2550 psig (P_o = 2500 psig, T_o = 496°F):

PUMP	LINE	BOUNDARY
1-RC-P-1A	1 1/2"-CH-398-1502-Q1	1st flange
	1" & 3/4" line	1-CH-342
	1" & 3/4" line	1-CH-341
1-RC-P-1B	1 1/2"-CH-397-1502-Q1	1st flange
	1" & 3/4" line	1-CH-364
	1" & 3/4" line	1-CH-363
1-RC-P-1C	1 1/2"-CH-396-1502-Q1	1st flange
	1" & 3/4" line	1-CH-386
	1" & 3/4" line	1-CH-385

Licensee's Proposed Alternative Evaluation: None. The Licensee states that the normal system leakage test per IWB-5221 with visual (VT-2) examination after each refueling is an adequate alternative to verify the integrity of these components.

Licensee's Basis for Requesting Relief: The Licensee states that pressurizing the piping listed above to the pressures required by Section XI will also pressurize the reactor coolant system. The seal injection flow is provided from the charging pumps to the reactor coolant pump. This flow divides in the pump with part of the flow being introduced to the RCS, and part of the flow passing over the pump seals and through the various seal returns. Since the seal injection directly adds to the RCS inventory, and no intermediate isolation exists, any pressurization above normal charging pressure would require that the RCS be pressurized to the same amount. This would exceed the ASME Class 1 hydrostatic test pressure (2280 psig) limits on the balance of the reactor coolant system.

Evaluation: The system's design does not permit pressurizing the sections of piping to the Code-required pressure without potential damage to the reactor coolant system. The Code-required test pressure is therefore impractical to attain. Imposition of this Code requirement on Virginia Electric and Power Company would necessitate redesign and/or replacement of the reactor coolant pumps and would not be significantly compensated for by an increase in safety above that provided by the system leakage test. The sections of piping will be pressure

tested at normal operating pressure and receive a VT-2 visual examination.

Conclusions: It is concluded that the Code-required hydrostatic test is impractical to perform at North Anna, Unit 1, and that public safety will not be endangered by allowing a VT-2 examination during the Code-required system leakage test to be performed in lieu of the required system hydrostatic pressure test. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.1.2 Request for Relief SPT-2, System Hydrostatic Test of Class 1 Chemical and Volume Control Piping

Code Requirement: Section XI, Subparagraph IWB-5210(a)(2) requires that the Class 1 pressure retaining components receive a system hydrostatic test [IWA-5211(d)] at the frequency stated and visual examination by the method specified in Table IWB-2500-1, Examination Category B-P. Subparagraph IWB-5222(a) states that the system hydrostatic test may be conducted at any test pressure specified in Table IWB-5222-1 corresponding to the selected test temperature, provided the requirements of IWB-5230 are met for all ferritic steel components within the boundary of the system (or portion of system) subject to the test pressure (see IWA-5245).

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic test of the following Class 1 chemical and volume control piping at a test pressure of 2550 psig (P_o = 2500 psig, T_o = 496°F):

LINES	BETWEEN VALVES
2"-CH-68-1502-Q1	1-CH-328 and 1-CH-HCV-1311
3"-CH-1-1502-Q1	1-CH-325 and 1-CH-496

Licensee's Proposed Alternative Examination: As an alternative, the reactor coolant system will be pressurized to a pressure as

close as practical to 2335 psig but not less than 2300 psig while the reactor is in a shutdown condition in order to seat check valves 1-CH-325 and 1-CH-328, thus creating a pressure boundary. The components listed above will then be tested at a pressure between 2300 psig and 2335 psig using a charging pump.

Licensee's Basis for Requesting Relief: Check valves 1-CH-328 and 1-CH-325 prevent the components listed above from being pressurized to Section XI requirements without pressurizing the reactor coolant system. The Code-required test pressure of 2550 psig will overpressurize the reactor coolant system.

Also, the power operated relief valves (1-RC-PCV-1456 and 1-RC-PCV-1455C) of the reactor coolant system are designed to limit the pressurizer pressure to a value below the fixed high-pressure reactor trip setpoint (2385 psig). The relief valve setpoints are 2335 psig. It is not desirable to take the reactor coolant system above the power operated relief valve setpoint.

Evaluation: As shown in drawing 11715-CBM-095C-2, Sheet 1 of 2, the design of the system does not provide adequate shutoff boundaries to prevent overpressurization of the lower pressure rated Class 1 piping. The design of these lines, therefore, makes the Code-required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, these lines would have to be modified to be isolatable from the lower pressure rated Class 1 piping. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Licensee's proposed alternative is to perform a hydrostatic test at a test pressure between 2300 psig and 2335 psig in lieu of the Code-required test pressure of 2550 psig. The proposed alternative test will provide adequate assurance that unallowable

inservice flaws have not developed in the subject portions of piping or that they will be detected and removed or repaired prior to the return of the piping to service.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the subject portions of Class 1 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.1.3 Request for Relief SPT-3, System Hydrostatic Test of Class 1 Residual Heat Removal Piping

Code Requirement: Section XI, Subsubparagraph IWB-5210(a)(2) requires that the Class 1 pressure retaining components receive a system hydrostatic test [IWA-5211(d)] at the frequency stated and visual examination by the method specified in Table IWB-2500-1, Examination Category B-P. Subparagraph IWB-5222(a) states that the system hydrostatic test may be conducted at any test pressure specified in Table IWB-5222-1 corresponding to the selected test temperature, provided the requirements of IWB-5230 are met for all ferritic steel components within the boundary of the system (or portion of system) subject to the test pressure (see IWA-5245).

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of residual heat removal line 14"-RH-1-1502 (Class 1) between valves 1-RH-MOV-1700 and 1-RH-MOV-1701.

Licensee's Proposed Alternative Examination: As an alternative, the components listed above will be tested in accordance with IWC-5222 during the hydrostatic test administered to line

14"-RH-2-602. The test pressure will be 584 psig as determined by the set point of relief valves 1-RH-RV-1721A and 1-RH-RV-1721B. This alternative is considered sufficient since the relief valves are set at 467 psig. As a result, line 14"-RH-1-1502 should not see a pressure significantly higher than 467 psig. In addition, 1-RH-MOV-1700 and 1-RH-MOV-1701 will not open if the reactor coolant pressure is 660 psig.

Licensee's Basis for Requesting Relief: During the system hydrostatic test of the primary system, 1-RH-MOV-1700 and 1-RH-MOV-1701 are closed in order to prevent possible overpressurization of the residual heat removal system. Thus, the portion of the RHR system identified above cannot be pressurized with the primary system and, due to system design, it cannot be pressurized without opening one of the MOVs.

Evaluation: As shown in drawing 11715-CBM-094A-2, Sheet 1 of 2, it is impractical to pressurize the piping between valves 1-RH-MOV-1700 and 1-RH-MOV-1701. The subject valves are pressure interlocked for automatic closure to prevent accidental overpressurization of the attached Class 2 piping in the RHR system. This safety feature would have to be bypassed to allow 1-RV-MOV-1700 to remain open during RCS pressurization, defeating the designed safeguard.

The Licensee has proposed testing this section of piping to the requirements for Class 2 hydrostatic tests. The proposed alternative test will provide adequate assurance that unallowable inservice flaws have not developed in the subject section of piping.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the Class 1 piping between the subject MOVs is impractical to perform at North Anna, Unit 1, and that the public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to

10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.1.4 Request for Relief SPT-4, System Hydrostatic Test of Class 1 Safety Injection Piping

Code Requirement: Section XI, Subsubparagraph IWB-5210(a)(2) requires that the Class 1 pressure retaining components receive a system hydrostatic test [IWA-5211(d)] at the frequency stated and visual examination by the method specified in Table IWB-2500-1, Examination Category B-P. Subparagraph IWB-5222(a) states that the system hydrostatic test may be conducted at any test pressure specified in Table IWB-5222-1 corresponding to the selected test temperature, provided the requirements of IWB-5230 are met for all ferritic steel components within the boundary of the system (or portion of system) subject to the test pressure (see IWA-5245).

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the Class 1 safety injection piping located between the following valves (P_o = 2235 psig, T_o = 160°F, required test pressure = 2432 psig):

VALVES	LINES
1-SI-83, 1-SI-190, and 1-SI-195	6"-SI-131-1502
1-SI-86, 1-SI-192, and 1-SI-197	6"-SI-133-1502
1-SI-89, 1-SI-194, and 1-SI-199	6"-SI-132-1502
1-SI-95, 1-SI-211, and 1-SI-204	6"-SI-19-1502 2"-SI-59-1502
1-SI-99, 1-SI-209, and 1-SI-203	6"-SI-21-1502 2"-SI-61-1502
1-SI-103, 1-SI-213, and 1-SI-205	6"-SI-16-1502 2"-SI-63-1502

Licensee's Proposed Alternative Examination: As an alternative, the reactor coolant system will be pressurized to a pressure as

close as practical to 2335 psig but not less than 2300 psig while the reactor is in a shutdown condition to create a pressure boundary at the first valve of each set listed above. These components will then be tested to a pressure between 2300 psig and 2335 psig using a charging pump. The reactor coolant system will be borated to a concentration equal to or greater than cold shutdown boron concentration.

Licensee's Basis for Requesting Relief: The first valve in each set of valves listed above prevent the components listed above from being pressurized without pressurizing the reactor coolant system. The power operated relief valves (1-RC-PCV-1456 and 1-RC-PCV-1455C) of the reactor coolant system are designed to limit the pressurizer pressure to a value below the fixed high-pressure reactor trip setpoint (2385 psig). The relief valve setpoints are 2335 psig, which is below the test pressure of 2432 psig. It is not desirable to take the reactor coolant system above the power operated relief valve setpoint.

Evaluation: The subject portions of piping are shown in drawing 11715-CBM-096B-2, Sheet 4 of 4. The design of the system is such that this piping cannot be pressurized without pressurizing the reactor coolant system, which is limited to a test pressure of 2335 psig due to the power operated relief valve setpoints. The Code-required hydrostatic test at 2432 psig, therefore, is impractical to perform. In order to perform the hydrostatic test in accordance with the requirement, this piping would require extensive design modifications. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Licensee's proposed alternative is to perform a hydrostatic test at a test pressure between 2300 psig and 2335 psig in lieu of the Code-required test pressure of 2432 psig. Because the proposed test pressure is above the nominal operating pressure, the proposed alternative test will provide adequate assurance

that unallowable inservice flaws have not developed in the subject portions of piping or that they will be detected and removed or repaired prior to the return of the piping to service.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the subject portions of Class 1 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2 Class 2 System Pressure Tests

3.4.2.1 Request for Relief SPT-1 (Part 2 of 2), System Hydrostatic Test of Class 2 Chemical and Volume Control Piping

Code Requirement: Section XI, Subsubparagraph IWC-5210(a)(3) requires that the pressure retaining components within each system boundary be subjected to a system hydrostatic pressure test [IWA-5211(d)] for each system or portions of systems and for repaired or replaced components, or altered portions of systems and be visually examined by the method specified in Table IWC-2500-1, Examination Category C-H. Subparagraph IWC-5222(a) requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with Design Temperature of 200°F or less, and at least 1.25 times the system pressure for systems with Design Temperature above 200°F. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic test of the following Class 2 piping in the chemical and volume control system at a pressure of 3419 psig (P_d = 2735 psig, T_o = 250°F):

PUMP	LINE	BOUNDARY
1-RC-P-1A	2"-CH-214-1502-Q1	1st flange
	3/4"-CH-372-1502-Q1	1st flange
1-RC-P-1B	2"-CH-215-1502-Q1	1st flange
	3/4"-CH-373-1502-Q1	1st flange
1-RC-P-1C	2"-CH-216-1502-Q1	1st flange
	3/4"-CH-374-1502-Q1	1st flange

Licensee's Proposed Alternative Examination: None. The Licensee states that the normal system leakage test per IWB-5221 with visual (VT-2) examination after each refueling will adequately verify the integrity of these components.

Licensee's Basis for Requesting Relief: The Licensee states that pressurizing the piping listed above to the pressures required by Section XI will also pressurize the reactor coolant system. The seal injection flow is provided from the charging pumps to the reactor coolant pump. This flow divides in the pump with part of the flow being introduced to the RCS, and part of the flow passing over the pump seals and through the various seal returns. Since the seal injection directly adds to the RCS inventory, and no intermediate isolation exists, any pressurization above normal charging pressure would require that the RCS be pressurized to the same amount. This would exceed the ASME Class 1 hydrostatic test pressure (2280 psig) limits on the balance of the reactor coolant system.

Evaluation: The system's design does not permit pressurizing the sections of piping to the Code-required pressure without potential damage to the reactor coolant system. The Code-required test pressure is therefore impractical to attain. Imposition of this Code requirement on Virginia Electric and Power Company would necessitate redesign and/or replacement of

the reactor coolant pumps and would not be significantly compensated for by an increase in safety above that provided by the system leakage test. The sections of piping will be pressure tested at normal operating pressure and receive a VT-2 visual examination.

Conclusions: It is concluded that the Code-required hydrostatic test is impractical to perform at North Anna, Unit 1, and that public safety will not be endangered by allowing the VT-2 examination during the Code-required system leakage test to be performed in lieu of the required system hydrostatic pressure test. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.2 Request for Relief SPT-5, System Hydrostatic Test of Class 2 Chemical and Volume Control Piping

Code Requirement: Section XI, Subsubparagraph IWC-5210(a)(3) requires that the pressure retaining components within each system boundary be subjected to a system hydrostatic pressure test [IWA-5211(d)] for each system or portions of systems and for repaired or replaced components, or altered portions of systems and be visually examined by the method specified in Table IWC-2500-1, Examination Category C-H. Subparagraph IWC-5222(a) requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with Design Temperature of 200°F or less, and at least 1.25 times the system pressure for systems with Design Temperature above 200°F. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the following Class 2 chemical and volume control piping (required test pressure is 3419 psig since there are no relief valves for these components):

LINES	BETWEEN VALVES
3/4"-CH-240-1502	1-CH-496, 1-CH-HCV-1311, and
2"-CH-68-1502	1-CH-MOV-1289A
3"-CH-1-1502	
3"-CH-79-1502	

Licensee's Proposed Alternative Examination: As an alternative, the reactor coolant system will be pressurized to a pressure as close as practical to 2335 psig but not less than 2300 psig using a charging pump, while the reactor is in a shutdown condition, to create a pressure boundary at check valves 1-CH-328 and 1-CH-496. The components listed above will then be tested to a pressure between 2300 psig and 2335 psig using a charging pump.

Licensee's Basis for Requesting Relief: Check valves 1-CH-328, 1-CH-325, and 1-CH-496 prevent the components listed above from being pressurized without pressurizing the reactor coolant system. The Code-required test pressure of 3419 psig will overpressurize the reactor coolant system.

Also, the power operated relief valves (1-RC-PCV-1456 and 1-RC-PCV-1445C) of the reactor coolant system are designed to limit the pressurizer pressure to a value below the fixed high-pressure reactor trip setpoint (2385 psig). The relief valve setpoints are 2335 psig. It is not desirable to take the reactor coolant system above the power operated relief valve setpoint.

Evaluation: As shown in drawing 11715-CBM-095C-2, Sheet 1 of 2, the design of the system does not provide adequate shutoff boundaries to prevent overpressurization of the eactor coolant system piping. The design of these lines, therefore, makes the Code-required hydrostatic test impractical to perform. In order

to perform the hydrostatic test in accordance with the requirements, these lines would have to be modified to be isolatable from the reactor coolant system piping. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Licensee's proposed alternative is to perform a hydrostatic test at a test pressure between 2300 psig and 2335 psig in lieu of the Code-required test pressure of 3419 psig. The proposed alternative test will provide adequate assurance that unallowable inservice flaws have not developed in the subject portions of piping or that they will be detected and removed or repaired prior to the return of the piping to service.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the subject portions of Class 2 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.3 Request for Relief SPT-6, System Hydrostatic Test of Class 2 Safety Injection Piping

Code Requirement: Section XI, Subsubparagraph IWC-5210(a)(3) requires that the pressure retaining components within each system boundary be subjected to a system hydrostatic pressure test [IWA-5211(d)] for each system or portions of systems and for repaired or replaced components, or altered portions of systems and be visually examined by the method specified in Table IWC-2500-1, Examination Category C-H. Subparagraph IWC-5222(a) requires that the system hydrostatic test pressure be at least

1.10 times the system pressure for systems with Design Temperature of 200°F or less, and at least 1.25 times the system pressure for systems with Design Temperature above 200°F. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the following Class 2 safety injection piping (P_d = 2485 psig, T_d < 200°F, required test pressure is 2733.5 psig):

VALVE	CONNECTING LINE	VALVE
1-SI-MOV-1890C and	10"-SI-18-1502	
1-SI-MOV-1890D	10"-SI-238-1502	
	to 6"-SI-133-1502	1-SI-197
	to 6"-SI-132-1502	1-SI-199
	to 6"-SI-131-1502	1-SI-195
1-SI-MOV-1890A	10"-SI-15-1502	
	to 6"-SI-16-1502	1-SI-213
	to 6"-SI-130-1502	1-SI-211
	to 6"-SI-19-1502	
1-SI-MOV-1890B	10"-SI-140-1502	
	to 6"-SI-21-1502	1-SI-209
1-SI-193	2"-SI-55-1502	1-SI-194
1-SI-191	2"-SI-53-1502	1-SI-192
1-SI-188	2"-SI-51-1502	1-SI-190

Licensee's Proposed Alternative Examination: As an alternative, the reactor coolant system will be pressurized to a pressure as close as practical to 2335 psig but not less than 2300 psig while the reactor is in a shutdown condition to create a pressure boundary at check valves 1-SI-83, 1-SI-86, 1-SI-89, 1-SI-95, 1-SI-99, and 1-SI-103. These components will then be tested to a pressure between 2300 psig and 2335 psig using a test pump.

Licensee's Basis for Requesting Relief: Check valves 1-SI-83, 1-SI-86, 1-SI-89, 1-SI-95, 1-SI-99, and 1-SI-103 prevent the components listed above from being pressurized without pressurizing the reactor coolant system. The Code-required test pressure of 2733.5 psig will overpressurize the reactor coolant system.

The power operated relief valves (1-RC-PCV-1456 and 1-RC-PCV-1455C) of the reactor coolant system are designed to limit the pressurizer pressure to a value below the fixed high-pressure reactor trip setpoint (2385 psig). The relief valves setpoints are 2335 psig, which is below the test pressure of 2733.5 psig. It is not desirable to take the reactor coolant system above the power operated relief valve setpoint.

Evaluation: As shown in drawings 11715-CBM-096A, Sheet 2 of 3, and 11715-CBM-096E, Sheet 4 of 4, the design of the system does not provide adequate shutoff boundaries to prevent overpressurization of the reactor coolant system piping. The design of these lines, therefore, makes the Code-required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, these lines would have to be modified to be isolatable from the reactor coolant system piping. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Licensee's proposed alternative is to perform a hydrostatic test at a test pressure between 2300 psig and 2335 psig in lieu of the Code-required test pressure of 2733.5 psig. The proposed alternative test will provide adequate assurance that unallowable inservice flaws have not developed in the subject portions of piping or that they will be detected and removed or repaired prior to the return of the piping to service.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the subject portions of Class 2 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.4 Request for Relief SPT-7, System Hydrostatic Test of Class 2 Safety Injection Piping

Code Requirement: Section XI, Subsubparagraph IWC-5210(a)(3) requires that the pressure retaining components within each system boundary be subjected to a system hydrostatic pressure test [IWA-5211(d)] for each system or portions of systems and for repaired or replaced components, or altered portions of systems and be visually examined by the method specified in Table IWC-2500-1, Examination Category C-H. Subparagraph IWC-5222(a) requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with Design Temperature of 200°F or less, and at least 1.25 times the system pressure for systems with Design Temperature above 200°F. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the following Class 2 safety injection piping (P_d = 2485 psig, T_d = 200°F, required test pressure is 2733.5 psig):

VALVES	LINE NUMBERS
1-SI-MOV-1865A, 1-SI-125 and 1-SI-123	12"-SI-123-1502 3/4"-SI-78-1502
1-SI-MOV-1865B, 1-SI-142 and 1-SI-140	12"-SI-124-1502 3/4"-SI-84-1502
1-SI-MOV-1865C, 1-SI-159 and 1-SI-157	12"-SI-125-1502 3/4"-SI-80-1502

Licensee's Proposed Alternative Examination: As an alternative, it is requested that the Class 2 components listed above be tested to the conditions of IWB-5222, which are required for the adjacent Class 1 piping. The nominal operating pressure is 660 psig and temperature is 120°F. Thus, testing per IWB-5222 would require a test pressure of 724 psig. This should be adequate considering the nominal operating conditions.

Licensee's Basis for Requesting Relief: Check valves 1-SI-125, 1-SI-142, and 1-SI-159 at the Class 1 and 2 system boundaries prevent the pressurization of the above components without pressurizing the primary system. The required test pressure of 2733.5 psig, as stated above, would overpressurize the primary system.

Evaluation: As shown in drawings 11715-CBM-096B-2, Sheets 1 of 4, 2 of 4, and 3 of 4, the design of the system does not provide adequate shutoff boundaries to prevent overpressurization of the adjacent Class 1 piping. The design of these lines, therefore, makes the Code-required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, these lines would have to be modified to be isolatable from the adjacent Class 1 piping. Imposition of the requirement on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Licensee's proposed alternative is to perform a hydrostatic test of the subject Class 2 portions of piping to the

requirements of IWB-5222 for Class 1 piping. This test will be performed at a test pressure of 724 psig (required test pressure for adjacent Class 1 piping). Since the nominal operating pressure of this piping is 660 psig, the proposed alternative test will provide adequate assurance that unallowable inservice flaws have not developed in the subject portions of piping or that they will be detected and removed or repaired prior to the return of the piping to service.

Concl sions: It is concluded that the hydrostatic test required b ction XI of the ASME Code for the subject portions of Class 2 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.2.5 Request for Relief SPT-8, System Hydrostatic Test of Secondary Side of the Steam Generators and Attached Class 2 Unisolatable Piping

Code Requirement: Section XI, Subsubparagraph IWC-5210(a)(3) requires that the pressure retaining components within each system boundary be subjected to a system hydrostatic pressure test [IWA-5211(d)] for each system or portions of systems and for repaired or replaced components, or altered portions of systems, and be visually examined by the method specified in Table IWC-2500-1, Examination Category C-H. Subparagraph IWC-5222(a) requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with Design Temperature of 200°F or less, and at least 1.25 times the system pressure for systems with Design Temperature above 200°F. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For

systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure. Subparagraph IWA-5213(d) requires a 4 hour holding time after attaining the system hydrostatic test pressure and temperature conditions for insulated systems, and 10 minutes for noninsulated systems or components.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the secondary side of the steam generators and attached unisolatable piping in the main steam, decay heat release, feedwater, chemical feed, blowdown, and sampling systems. See Table SPT-8 for a complete listing of components.

SYSTEM	P_d (psig)	T_d (°F)	REQUIRED TEST PRESSURE (psig)
Feedwater	1100	>200	1375
Chemical Feed	1775	<200	1952.5
Remaining Components	1085	>200	1356

Licensee's Proposed Alternative Examination: The Westinghouse Technical Manual for the steam generators requires the secondary side to be pressurized to 1356 psig, held for 30 minutes, and then reduced to design pressure (1085 psig) for a sufficient time to permit proper examination of welds, closures, and surfaces for leakage or weeping.

Licensee's Basis for Requesting Relief: Westinghouse, the manufacturer of the steam generators, gives specific testing requirements for the steam generator that must also be applied to the components listed in the relief request because these components cannot be isolated from the steam generators.

Evaluation: The design of the system does not provide adequate shutoff boundaries to prevent overpressurization of the lower pressure rated Class 2 piping and steam generators. The design of these lines, therefore, makes the Code-required hydrostatic

test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, these lines would have to be modified to be isolatable from the lower rated Class 2 piping and steam generators. Imposition of the requirements on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Code-required holding time is 4 hours after attaining the test pressure and temperature conditions for insulated systems. This is to allow any leakage to penetrate the insulation that is not removed. In lieu of a holding time of 4 hours at 1356 psig, the Licensee proposes to pressurize the secondary side of the steam generators and associated piping to 1356 psig for 30 minutes and then reduce the pressure to 1085 psig for the balance of the 4-hour holding period. The alternative holding time and pressures recommended by the manufacturer, which are proposed in lieu of the Code-required holding time and pressure, will provide adequate assurance of the continued inservice structural integrity.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the subject portions of Class 2 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

Table SPT-8
Components

FROM COMPONENT	CONNECTED PIPING	TO COMPONENT
1-RC-E-1A	32"-SHP-1-601	1-MS-SV-101A
	to 32"-SHP-22-601	1-MS-SV-102A
		1-MS-SV-103A
		1-MS-SV-104A
		1-MS-SV-105A
	to 6"-SHP-37-601 &	
	1"-SHP-84-601	1-MS-PCV-101A
	to 3"-SHP-64-601 &	1-MS-18
	1"-SHP-78-601	1-MS-327
	to 1 1/2"-SHPD-6-601	1-MS-22
	to 1/2"-SHPD-71-601	1-MS-26
1-RC-E-1A	32"-SHP-1-601	1-MS-35
		1-NRV-MS-[illegible]
	3"-SHP-60-601	1-MS-3[illegible]
1-RC-E-1A	32"-SHP-1-601	
	to 32"-SHP-22-601	
	to 3"-SHP-45-601	1-MS-344
	to 3"-SHP-531-601	1-MS-NRV-103A
	to 1"-SHP-518-601	1-MS-346
		1-MS-348
1-RC-E-1A	2"-SS-302-601	1-SS-576
1-RC-E-1A	32"SHP-1-601	
	to 32"-SHP-22-601	
	to 3"-SDHV-1-601	
	to 4"-SDHV-4-601	1-MS-20
1-RC-E-1A	16"-WFPD-24-601	1-FW-47
	to 3"-WAPD-427-601	1-FW-68
	to 3/4"-CFPD-1-601	1-WT-39
1-RC-E-1A	2"-WGCB-4-601	1-BD-1
	2"-WGCB-5-601	1-BD-4
	1"-WGCB-6-601	1-BD-2
1-RC-E-1A	2"-SGD-4-601	1-WT-459

Table SPT-8
Components
(continued)

FROM COMPONENT	CONNECTED PIPING	TO COMPONENT
1-RC-E-1B	32"-S..P-2-601	
	to 32"-SHP-23-601	1-MS-SV-101B
		1-MS-SV-102B
		1-MS-SV-103B
		1-MS-SV-104B
		1-MS-SV-105B
	to 6"-SHP-38-601 &	
	1"-SHP-85-601	1-MS-PVC-101B
	to 3"-SHP-65-601	1-MS-325
	1"-SHP-80-601	1-MS-57
	to 1 1/2"-SHPD-8-601	1-MS-60
	to 1/2"-SHPD-73-601	1-MS-64
1-RC-E-1B	32"-SHP-2-601	1-MS-74
		1-MS-NRV-101B
	3"-SHP-61-601	1-MS-353
1-RC-E-1B	32"-SHP-2-601	
	to 32"-SHP-23-601	
	to 3"-SHP-46-601	1-MS-352
	to 3"-SHP-61-601	1-MS-353
	to 3"-SHP-533-601	1-MS-NRV-103B
	to 1"-SHP-520-601	1-MS-356
		1-MS-357
1-RC-E-1B	2"-SS-225-601 &	
	1"-SS-303-601	1-SS-218
1-RC-E-1B	32"-SHP-2-601	
	to 32"-SHP-23-601	
	to 3"-SDHV-2-601	
	to 4"-SDHV-4-601	1-MS-20
1-RC-E-1B	16"-WFPD-23-601	1-FW-79
	to 3"-WAPD-28-601	1-FW-100
	to 3/4"-CFPD-2-601	1-WT-51
1-RC-E-1B	2"-WGCB-7-601	1-BD-10
	2"-WGCB-8-601	1-BD-13
	2"-WGCB-9-601	1-BD-11
1-RC-E-1B	2"-SGD-5-601	1-WT-482
1-RC-E-1C	32"-SHP-3-601	

Table SPT-8
Components
(continued)

FROM COMPONENT	CONNECTED PIPING	TO COMPONENT
	to 32"-SHP-24-601	1-MS-SV-101C 1-MS-SV-102C 1-MS-SV-103C 1-MS-SV-104C 1-MS-SV-105C
	to 6"-SHP-39-601 & 1"-SHP-86-601	1-MS-PCV-101C
	to 3"-SHP-66-601 & 1"-SHP-82-601	1-MS-95 1-MS-23
	to 1 1/2"-SHPD-7-601	1-MS-98
	to 1/2"-SHPD-75-601	1-MS-412
1-RC-E-1C	32"-SHP-3-601	1-MS-112 1-MS-NRV-1C
	3"-SHP-62-601	1-MS-362
1-RC-E-1C	32"-SHP-3-601 to 32"-SHP-24-601 to 3"-SHP-47-601 to 3"-SHP-62-601 to 3"-SHP-532-601 to 1"-SHP-519-601 &	 1-MS-362 1-MS-NRV-103C 1-MS-365 1-MS-1048
1-RC-E-1C	2"-SS-227-601 1"-SS-304-601	 1-SS-217
1-RC-E-1C	32"-SHP-3-601 to 32"-SHP-24-601 to 3"-SDHV-3-601 to 4"-SDHV-4-601	 1-MS-20
1-RC-E-1C	16"-WFPD-22-601 to 3"-WAPD-29-601 to 3/4"-CFPD-3-601	1-FW-111 1-FW-132 1-WT-67
1-RC-E-1C	2"-WGCB-10-601 2"-WGCB-11-601 1"-WGCB-12-601	1-BD-19 1-BD-22 1-BD-20
1-RC-E-1C	2"-SGD-5-601	1-WT-505

3.4.3 Class 3 Syster Pressure Tests

3.4.3.1 Request for Relief SPT-9, System Hydrostatic Test of Class 3 Feedwater Piping

Code Requirement: Section XI, Subsubparagraph IWD-5210(a)(3) states that the pressure retaining components within the boundary of each system specified in the Examination Categories of Table IWD-2500-1 shall be pressure tested and examined in accordance with Table IWD-2500-1 during a system hydrostatic test [IWA-5211(d)]. The system hydrostatic test shall be conducted in accordance with IWA-5000, as applicable.

Subparagraph IWD-5223(a) requires that the system hydrostatic test pressure be at least 1.10 times the system pressure for systems with design temperature of 200°F or less, and at least 1.25 times the system pressure for systems with design temperature above 200°F. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure. Subparagraph IWA-5213(d) requires a 4 hour holding time after attaining the system hydrostatic test pressure and temperature conditions for insulated systems, and 10 minutes for noninsulated systems or components.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic test of the following Class 3 feedwater piping between the listed valves:

VALVE	CONNECTING LINES	VALVE
1-FW-62	3"-WAPD-10-601 to 3"-WAPD-9-601	1-FW-66
1-FW-64	3"-WAPD-9-601	1-FW-70
1-FW-93	3"-WAPD-12-601 to 3"-WAPD-11-601	1-FW-98
1-FW-96	3"-WAPD-11-601	1-FW-102
1-FW-126	3"-WAPD-14-601 to 3" WAPD-13-601	1-FW-130
1-FW-128	3"-WAPD-13-601	1-FW-134
1-FW-278	4"-WAPD-09-601 to 3"-WAPD-10-601	1-FW-66

Licensee's Proposed Alternative Examination: Since the components listed cannot be pressurized without pressurizing the steam generators, they must be tested per the manufacturer's hydrostatic test method. Therefore, the proposed alternative examination is the examination described in the Westinghouse Technical Manual for the secondary side of the steam generators. The examination procedure is to pressurize the secondary side of the steam generators to 1356 psig, hold for 30 minutes, reduce to the design pressure (1085 psig), hold for 3 1/2 hours, and then perform a VT-2 examination.

Licensee's Basis for Requesting Relief: Due to check valves 1-FW-132, 1-FW-100, and 1-FW-68, the piping listed cannot be pressurized without pressurizing the steam generators. The Code-required test pressure of 1540 psig would overpressurize the steam generators.

Evaluation: The design of the system does not provide adequate shutoff boundaries to prevent overpressurization of the steam generators. The design of these lines, therefore, makes the Code-required hydrostatic test impractical to perform. In order to perform the hydrostatic test in accordance with the requirements, these lines would have to be modified to be isolatable from the steam generators. Imposition of the

requirements on Virginia Electric and Power Company would cause a burden that would not be compensated significantly by an increase in safety above that provided by the proposed alternative.

The Code-required holding time is 4 hours after attaining the test pressure and temperature for insulated systems to allow any leakage to penetrate the insulation that is not removed. In lieu of a holding time of 4 hours at 1540 psig, the Licensee proposes to pressurize the secondary side of the steam generators and associated piping to 1356 psig for 30 minutes and then reduce the pressure to 1085 psig for the balance of the 4-hour holding period. The alternative holding time and pressures recommended by the manufacturer, which are proposed in lieu of the Code-required holding time and pressure, will provide adequate assurance of the continued inservice structural integrity.

Conclusions: It is concluded that the hydrostatic test required by Section XI of the ASME Code for the subject portions of Class 3 piping is impractical to perform at North Anna, Unit 1, and that public health and safety will not be endangered by allowing the proposed alternative test to be performed in lieu of the Code requirement. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that relief be granted as requested.

3.4.4 General

3.4.4.1 Request for Relief SPT-10, System Hydrostatic Tests of Class 1, 2, and 3 Piping

NOTE: In the May 31, 1991 response to the NRC request for additional information, the Licensee withdrew Relief Request SPT-10 based on a reevaluation of the ASME Code requirement.

3.5 General

3.5.1 Ultrasonic Examination Techniques (No relief requests)

3.5.2 Exempted Components

3.5.2.1 Request for Relief NDE-10, VT-3 Visual Examination of the Class 3 1-Inch NPS Integral Attachment Welds in the Auxiliary Feedwater System

NOTE: In the May 31, 1991 response to the NRC request for additional information, the Licensee withdrew Relief Request NDE-10 based on their reassessment of impracticality.

3.5.3 Other

3.5.3.1 Request for Relief NDE-11, Requirements for Ultrasonic Calibration Blocks

Code Requirement: Section XI, Paragraphs IWA-2232(a) and IWA-2232(c)(4) give specific requirements for the fabrication of ultrasonic calibration blocks.

Licensee's Code Relief Request: Relief is requested from the requirements of IWA-2232(a) and IWA-2232(c)(4).

Licensee's Proposed Alternative Examination: The existing ultrasonic calibration blocks will be used for the second inspection interval examinations in lieu of blocks meeting current Code requirements. In addition, Code Case N-461, "Alternative Rules for Piping Calibration Block Thickness," will be used as necessary.

Licensee's Basis for Requesting Relief: North Anna Power Station was constructed prior to the issuance and adoption of ASME Section XI. Therefore, ultrasonic calibration blocks were

fabricated before the guidelines of ASME Section XI were developed and approved. Meeting the requirements of IWA-2232(a) and IWA-2232(c)(4) of the newer Code would require the manufacturing of new calibration blocks. Using the existing calibration blocks allows the correlation of ultrasonic data from the first interval inspections as required by IWA-1400(h).

Evaluation: In the May 31, 1991 response to the NRC request for additional information, the Licensee submitted a description of the differences between existing calibration blocks and those required by the Code. This description follows:

VRA-15: This block is used to examine 12 inch Schedule 40S piping welds.

Circumferential notch "B" is 0.004 inches less than the minimum depth specified by ASME Section XI, Appendix III, Supplement 7.

VRA-27: This block is used to examine welds on the boron injection tank and 2 1/2 inch thick pressurizer welds.

The notch on the clad side is 0.0034 inches over the maximum depth specified by ASME Section V, Figure T-431.1.

The 3/4 T hole used for straight beam calibration is 1/4 inch closer to the edge of the block than specified in Figure T-431.1.

The block is not the same material specification, but it is considered an equivalent material under the rules of Section V, Article 5.

VRA-21: This block is used for the steam generator secondary side welds and the pressurizer skirt attachment weld.

The block is 4 inches wide verses the 6 inch minimum width specified by Section V, Figure T-431.1.

The 3/4 T hole used for straight beam calibration is 1/2 inch closer to the block edge than specified in Figure T-431.1.

The block is not the same material specification as the steam generator or pressurizer skirt but it is the same carbon steel P-number as the steam generator. The block is considered an equivalent material for both components under the rules of Section V, Article 5.

VGB-20: This block is used for the reactor vessel head-to-flange weld and the steam generato· channel head-to-tube sheet weld.

The block is partially clad, however a 5/4 T calibration required by Section V, Article 4 can be accomplished from the unclad portion of the clad side of the block.

The block is not the same product form or material specification as the steam generator channel head, but it is the same material specification as the reactor vessel head-to-flange and steam generator tube sheet.

A new calibration block is being fabricated for the Unit 1 replacement steam generators that are scheduled for installation in the second period of the second interval.

VGB-21: This block is used for the 4 inch thick welds on the pressurizer.

The block is 4 inches wide verses the 6 inch minimum width specified by Section V, Figure T-431.1.

The 3/4 T hole used for straight beam calibration is 1/2 inch closer to the block edge than specified in Figure T-431.1.

The block is partially clad, however a 5/4 T calibration required by Section V, Article 4 can be accomplished from the unclad portion of the clad side of the block.

The block is not the same product form or material specification as the pressurizer head, but it is the same material specification as the pressurizer shell section.

VRA-01: This block is used to examine the 27 1/2 inch ID, 29 inch ID, and 31 inch ID reactor coolant loop piping welds.

The block was originally designed for use with a captivated water column longitudinal wave fixture and therefore does not contain an axial notch. The Licensee has subsequently developed an examination procedure utilizing a duel element focused longitudinal wave search unit. They intend to replace this block with two blocks (27 1/2 inch ID and 31 inch ID) that contain axial notches.

The Licensee does not plan to obtain a 29 inch ID block. Instead, they request to use the 31 inch ID block to perform calibrations to examine the 29 inch reactor coolant loop piping welds.

These differences have been evaluated and although the Code requirements have not been explicitly met, the use of the subject calibration blocks would provide consistent results with previous examinations. Because the existing blocks have been proven satisfactory for performing calibrations, the increase in plant safety would not compensate for the burden placed on the Licensee to fabricate new calibration blocks to the current Code.

The use of ASME Code Case N-461 is acceptable per NRC Regulatory Guide 1.147, Revision 8, provided that thickness measurements and weld joint contour of the pipe/component be known and used by the inspector who conducts the UT examination.

Conclusions: Based on the above, it is concluded that public health and safety will not be endangered by allowing the use of the alternative calibration blocks in lieu of the specific Code requirement. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that relief be granted as requested provided the conditions specified above for Code Case N-461 are applied. It should also be noted that the calibration standards listed in the Inservice Inspection Detail Drawings, Component Summary do not accurately reflect the applications described in the response to the NRC request for additional information.

3.5.3.2 Request for Relief NDE-12, Use of ASME Code Case N-460 for Examination of Class 1 and Class 2 Welds

Code Requirement: Section XI requires that the entire volume or area of a weld be examined before credit for examination can be given.

Licensee's Code Relief Request: The Licensee requests approval to use ASME Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds.

Licensee's Proposed Alternative Examination: ASME Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds, will be used in its entirety for determination of examination credit. Any limitations or modifications to this Code Case as indicated in Regulatory Guide 1.147, Revision 8, will be adhered to.

Licensee's Basis for Requesting Relief: Throughout the ISI Class 1 and ISI Class 2 systems, situations exist where the entire examination volume or area cannot be examined due to interference by another component or part geometry.

Evaluation: ASME Code Case N-460 provides for an alternative examination coverage for Class 1 and Class 2 welds. This Code Case was approved by the ASME Code Committee on July 27, 1988. The Code Case was approved in Revision 8 of USNRC Regulatory Guide 1.147 for generic use. Use of ASME Code Case N-460 is, therefore, acceptable for Class 1 and Class 2 welds.

Conclusions: It is concluded that the NRC has already approved the use of ASME Code Case N-460 per USNRC Regulatory Guide 1.147, Revision 8. Therefore, relief is not required.

3.5.3.3 Request for Relief NDE-13, Weld Reference System for Class 1 and 2 Piping, Vessels, and Components

Code Requirement: Section XI, Paragraph IWA-2610, Weld Reference System - General, requires that a reference system shall be established for all welds and areas subject to surface or volumetric examination. Each such weld and area shall be located and identified by a system of reference points. The system shall permit identification of each weld, location of each weld center line, and designation of regular intervals along the length of the weld.

Licensee's Code Relief Request: Relief is requested from establishing a weld reference system for all welds of Class 1 and 2 piping, vessels, and components.

Licensee's Proposed Alternative Examination: North Anna, Unit 1, has recently updated its weld isometrics, providing a detailed identification of location. It is the Licensee's intention to use these drawings for tracking and locating welds.

In addition, as welds requiring volumetric examinations are examined, a reference will be established for each weld, indicating a zero point and direction of examination. Welds that contain recordable indications shall be marked to ensure location of the indication, using appropriate reference marks. This reference system and marks will be permanently fixed on the weld.

Licensee's Basis for Requesting Relief: The original construction code used at North Anna Power Station, ANSI B31.7, 1969 Edition, did not establish a weld reference system. Immediate establishment of a weld reference system cannot be practically attained within the scope and schedule of existing outages.

Evaluation: For an operating plant, establishing a weld reference system for all welds and areas subject to surface or volumetric examination is a major effort and, in some cases, is prohibitive due to inaccessibility and/or high radiation levels. Therefore, the Code requirement for establishing a weld reference system for all welds subject to examination in the absence of examination is impractical for an operating plant. In order to establish a weld reference system for all welds and areas subject to surface and volumetric examinations in accordance with the requirements, many manhours and man-rems of radiation exposure would be required to perform such tasks as locating the welds, removing insulation, marking the welds, and reinstalling insulation, regardless of whether or not the weld is scheduled for examination. Imposition of the requirement on Virginia

Electric and Power Company would cause a burden that would not be compensated by an increase in public health and safety.

However, as inservice examinations of Class 1 and 2 piping systems are performed, each piping weld examined should receive all of the required reference markings. Impracticality will not exist for these welds since access will have been provided to perform examinations.

Conclusions: It is concluded that the marking of all welds and areas subject to surface or volumetric examinations required by Section XI of the ASME Code in the absence of inspection is impractical at North Anna, Unit 1, because it is an operating plant. However, as each Class 1 and 2 piping system is examined, access for marking each weld will be provided and impracticality for that particular weld will not exist. Therefore, in order to provide assurance of traceability of the piping welds and repeatability of examinations, it is recommended that relief be granted, pursuant to 10 CFR 50.55a(g)(6)(i), provided that each Class 1 and 2 piping weld examined receives all of the required reference markings as the inservice examinations are performed.

3.5.3.4 Request for Relief CS-1, Rules for Inservice Inspection of Class 1, 2, and 3 Component Supports

Code Requirement: Section XI, Subsection IWF gives requirements for the inservice inspection of Class 1, 2, and 3 component supports.

Subsubarticle IWF-1230, Supports Exempt from Examination and Test, is in the course of preparation.

Subparagraph IWF-2510(a), Supports Selected for Examination, states that component supports selected for examination shall be

the supports of those components that are required to be examined under IWB, IWC, and IWD during the first inspection interval.

Licensee's Code Relief Request: Relief is requested to use proposed ASME Code Case WGCS 89-1(b), which implements Subsection IWF as published in the 1989 ASME Code, Section XI, 1990 Addenda.

Licensee's Proposed Alternative Examination: The 1990 Addenda, Subsubarticle IWF-1230 states: "Component supports exempt from the examination requirements of IWF-2000 are those connected to components and items exempted from examination under IWB-1220, IWC-1220, IWD-1220, and IWE-1220. In addition, portions of supports that are inaccessible by being encased in concrete, buried underground, or encapsulated by guard pipe are also exempt from the examination requirements of IWF-2000."

IWF-2510 of the 1990 Addenda states: "Component supports to be examined shall be the supports of those components that are required to be examined under IWB-2500. IWC-2500, IWD-2500, and IWE-2500 by volumetric, surface, or visual (VT-1 or VT-3) examination methods. Piping supports to be examined shall be the supports of piping not exempted under IWB-1220, IWC-1220, IWD-1220, and IWE-1220."

Per Table IWF-2500-1, Examination Category F-A, of the 1990 Addenda, the following sampling plan will be used:

ISI Class 1 Piping Supports - Examine 25% of supports per interval. Notes 1, 2, and 4.

ISI Class 2 Piping Supports - Examine 15% of supports per interval. Notes 1, 2, and 4.

ISI Class 3 Piping Supports - Examine 10% of supports per interval. Notes 1, 2, and 4.

Supports Other Than Piping Supports - Examine 100% of supports per interval. Notes 3 and 4.

NOTES:

(1) Supports shall be categorized to identify support types by component support function (e.g., A = supports such as one directional rod hangers; B = supports such as multidirectional restraints; and C = supports that allow thermal movement, such as springs).

(2) The total percentage sample shall be comprised of supports from each system (such as main steam, feedwater, or RHR), where the individual sample sizes are proportional to the total number of nonexempt supports of each type and function within each system.

(3) For multiple components other than piping within a system of similar design, function, and service, the supports of only one of the multiple components are required to be examined.

(4) To the extent practical, the same supports selected for examination during the first inspection interval shall be examined during each successive inspection interval.

Licensee's Basis for Requesting Relief: Subsection IWF of the 1983 Edition, Section XI lacks a complete concise set of rules for the inservice inspection of component supports. The following areas in particular have been identified as needing clarification:

SUPPORTS EXEMPT FROM EXAMINATION AND TEST: IWF-1230 in the 1983 Edition, Section XI is "in the course of preparation". The Section XI Working Group on Component Supports (WGCS) has developed proposed Code Case WGCS 89-1(b). The proposed Code Case is implemented in the 1990 Addenda and includes a complete set of exemptions in Section IWF-1230.

SUPPORTS SELECTED FOR EXAMINATION: IWF-2510 in the 1983 Edition, Section XI states that component supports selected for examination shall be the supports of those components that are required to be examined under IWB, IWC, and IWD during the first inspection interval. These selection requirements are confusing in that the exemptions for these subsections have been modified significantly since the application of ASME Section XI, 1974 Edition, Summer 1975 Addenda for North Anna, Unit 2, Interval 1. ASME Code Case WGCS 89-1(b), as implemented by the 1990 Addenda,

includes in Subsubarticle IWF-2510, a clear, detailed set of guidelines for examination.

SAMPLING PROGRAM: The general philosophy of Section XI has evolved into a sampling program approach where a percentage of like components are examined to determine their suitability for continued service. Code Case WGCS 89-1(b), Table 2500-1, and the 1990 Addenda, Table IWF-2500-1, includes a specific sampling program for supports.

It is Virginia Electric and Power Company's position that the portions of WGCS 89-1(b), as implemented by the 1989 Edition, 1990 Addenda of Section XI presented in the Alternate Provisions section of this relief request, in conjunction with Subsection IWF of the 1986 Edition of Section XI, provide a complete, coherent and sound set of rules for the inservice inspection of component supports.

Evaluation: We concur with the Licensee that portions of Subsection IWF in ASME Code Editions prior to the 1990 Addenda are either nonexistent or unclear with regard to rules for the inservice inspection of component supports. The Licensee's proposal is to use the guidelines delineated in the proposed ASME Code Case WGCS 89-1(b) as implemented by 1989 Edition, 1990 Addenda of Section XI. We have reviewed this Code Case and have determined that the Licensee's proposed alternative for examination of component supports is an acceptable approach for exempting supports from examination and test, selecting supports for examination, and generating a sampling program and that it will provide assurance of the continued inservice structural integrity of the component supports.

Conclusions: It is concluded that the Licensee's proposed alternative provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that relief be granted as requested.

3.5.3.5 Request for Relief CS-2, VT-3 Visual Examination Per Winter 1984 Addendum Substituted for Current VT-3 and VT-4 Requirements

Code Requirements: Section XI, Table IWF-2500-1, Examination Category F-C, Item F3.50 requires a 100% VT-4 visual examination of spring type supports, constant load type supports, shock absorbers, and hydraulic and mechanical type snubbers as defined by Figure IWF-1300-1.

Licensee's Code Relief Request: Relief is requested from performing the Code-required VT-4 visual examination of supports.

Licensee's Proposed Alternative Examination: It is proposed that the following definition of a VT-3 examination from the Winter 1984 Addenda be substituted for the current VT-3 and VT-4 requirement:

(a) The VT-3 visual examination shall be conducted to determine the general mechanical and structural condition of components and their supports, such as the verification of clearances, settings, physical displacements, loose or missing parts, debris, corrosion, wear, erosion or the loss of integrity at bolted or welded connections.

(b) The VT-3 examination shall include examinations for conditions that could affect operability or functional adequacy of snubbers, and constant load and spring type supports.

(c) For component supports and component interiors, the visual examination may be performed remotely with or without optical aids to verify the structural integrity of the components.

Licensee's Basis for Requesting Relief: The VT-4 visual examination is only required for support examinations on Category F-C components (spring hanger, snubber, etc.) where operability

and functional adequacy need to be determined. It was recognized by the Code that these examinations (VT-3, VT-4) were closely related, and generally performed by the same individual qualified to each discipline. Although not endorsed in 10 CFR 50.55a, the Winter 1984 Addendum of the Code combined the VT-3 and VT-4 examinations to a singular VT-3 examination. Applying this reduction administratively would reduce qualification documents, examination records, review requirements, and reporting without eliminating the intent of the examination.

Evaluation: The VT-3 and VT-4 visual examinations have been combined as the VT-3 visual examination in the later editions of the Code (1986) to more clearly define the visual examination requirements. The VT-3 visual examination requirement in the 1986 Edition is equivalent to the Code requirements of the 1983 Edition, Summer 1983 Addenda and, therefore, is an acceptable alternative.

Conclusions: Based on the above evaluation, it is concluded that the proposed alternative examination is equivalent to the Code-required examination and provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is recommended that relief be granted as requested.

4. CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6) or, alternatively, 10 CFR 50.55a(a)(3), it has been determined that certain Section XI required inservice examinations cannot be performed to the extent required by the Code. Requests for Relief NDE-1, NDE-2, NDE-10, NDE-16, and SPT-1 were withdrawn by the Licensee and it was determined that relief was not required for Request for Relief NDE-12. In all remaining cases for which relief is requested the Licensee has demonstrated that specific Section XI requirements are impractical or that alternative examinations should be performed.

This technical evaluation has not identified any practical method by which the Licensee can meet all the specific inservice inspection requirements of Section XI of the ASME Code for the existing North Anna Power Station, Unit 1, facility. Compliance with all the exact Section XI required inspections would necessitate redesign of a significant number of plant systems, sufficient replacement components to be obtained, installation of the new components, and a baseline examination of these components. Even after the redesign efforts, complete compliance with the Section XI examination requirements probably could not be achieved. Therefore, it is concluded that public interest is not served by imposing certain provisions of Section XI of the ASME Code that have been determined to be impractical. Pursuant to 10 CFR 50.55a(g)(6), relief is allowed from these requirements that are impractical to implement, or alternatively, pursuant to 10 CFR 50.55a(a)(3), alternatives to the Code-required examinations may be granted provided that either (i) the proposed alternatives provide an acceptable level of quality and safety or that (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety. Relief may be granted only if granting the relief 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.

The development of new or improved examination techniques should continue to be monitored. As improvements in these areas are achieved, the Licensee

should incorporate these techniques in the ISI program plan examination requirements.

Based on the review of the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 2, and Plan, Revision 1, the Licensee's response to the NRC's request for additional information, and the recommendations for granting relief from the ISI examination requirements that have been determined to be impractical, it is concluded that the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 2, and Plan, Revision 1, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.

2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:

   1983 Edition through Summer 1983 Addenda
   1974 Edition through Summer 1975 Addenda
   1989 Edition through 1990 Addenda

3. NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 8, November 1990.

4. North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 1, dated November 21, 1990.

5. North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Plan, Revision 0, dated December 10, 1990.

6. NUREG-0800, Standard Review Plans, Section 5.2.4, "Reactor Coolant Boundary Inservice Inspection and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components," July 1981.

7. Letter, dated April 11, 1991, L. B. Engle (NRC) to W. L. Stewart [Virginia Electric and Power Company (VEPCO)], request for additional information on the Second 10-Year Interval ISI Program.

8. Letter, dated May 31, 1991, W. L. Stewart (VEPCO) to NRC, response to the NRC request for additional information.

9. North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Program, Revision 2, dated May 1991.

10. North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection Plan, Revision 1, dated May 1991.

11. Letter, dated November 27, 1991, W. L. Stewart (VEPCO) to NRC, regarding relief requests for steam generator and pressurizer nozzles for North Anna Power Station, Units 1 and 2.

12. NRC Regulatory Guide 1.14, "Reactor Coolant Pump Flywheel Integrity," Revision 1, August 1975.

13. NRC Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," Revision 1, February 1983.

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This report presents the results of the evaluation of the North Anna Power Station, Unit 1, Second 10-Year Interval Inservice Inspection (ISI) Program, Revision 2, and Plan, Revision 1, submitted May 31, 1991, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the Licensee has determined to be impractical. The North Anna Power Station, Unit 1, Second 10-Year Interval ISI Program Plan is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous Nuclear Regulatory Commission (NRC) reviews. The requests for relief are evaluated in Section 3 of this report.

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