VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

July 13, 2007

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

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License No. NPF-4
NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
THIRD INTERVAL ASME SECTION XI RELIEF REQUESTS
NORTH ANNA POWER STATION UNIT 1 RELIEF REQUEST CMP-023
NORTH ANNA POWER STATION UNIT 2 RELIEF REQUEST CMP-024

Pursuant to 10 CFR 50.55a(a)(3)(ii), Dominion requests relief from specific ASME Section XI examination requirements for the residual heat removal heat exchanger and regenerative heat exchanger welds for North Anna Units 1 and 2. North Anna Units 1 and 2 are presently in the third ten-year inservice inspection (ISI) interval and examinations are conducted in accordance with the requirements of the 1989 Edition of ASME Section XI and the 1995-96 Edition of the ASME Section XI Code, respectively. The attached relief requests provide the basis for use and the proposed alternatives to the ASME Section XI surface and volumetric examination requirements for the residual heat removal heat exchanger and regenerative heat exchanger welds.

Dominion requests approval of the relief requests by June 30, 2008 to support ASME Section XI examination and pressure testing of the residual heat removal and regenerative heat exchangers scheduled for the fall 2008 refueling outage.

If you have any questions regarding this submittal, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,

Gerald T. Bischof
Vice President – Nuclear Engineering

Attachment

1. Relief requests CMP-023 and CMP-024

Commitments made by this letter: None

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Third 10 Year Interval
Request for Relief Numbers CMP-023 and CMP-024

Virginia Electric & Power Company (Dominion)
North Anna Power Station Units 1 and 2

Virginia Electric & Power Company
North Anna Power Station Units 1 and 2
Third Ten Year Interval
Request for Relief Numbers CMP-023 and CMP-024

1. ASME Code Components Affected

Specific welds on the residual heat removal (1/2-RH-E-1A and 1/2-RH-E-1B) and regenerative heat exchangers (1/2-CH-E-3) identified below:

1/2-RH-E-1A/B (Drawing 11715/12050-WMKS-RH-E-1A/B - see Figure 1 typical)

Welds	Description	Category/Item	Class
1	Head Circumferential Weld	C-A/C1.20	2
2	Shell Circumferential Weld	C-A/C1.10	2
3A, 3B, 4A, 4B	Reinforcing Plate Welds to Nozzle and Vessel	C-B/C2.31	2

1-CH-E-3 (Drawing 11715-WMKS-CH-E-3 - see Figure 2)

Welds	Description	Category/Item	Class
3, 7, 11	tubesheet-to-head	B-B/B2.60	1
2, 6, 10	tubesheet-to-shell	B-B/B2.80	1
1, 4, 5, 8, 9, 12	circumferential head	B-B/B2.51	1
13, 14, 15, 16, 17	nozzle-to-vessel	B-D/B3.150	1
18, 23, 24, 25, 26	nozzle-to-vessel	B-D/B3.150	1
27, 28	nozzle-to-vessel	B-D/B3.150	1
13NIR/14NIR/15NIR/16NIR	nozzle inside radius	B-D/B3.160	1
17NIR/18NIR/23NIR/24NIR	nozzle inside radius	B-D/B3.160	1
25NIR/26NIR/27NIR/28NIR	nozzle inside radius	B-D/B3.160	1

2-CH-E-3 (Drawing 12050-WMKS-CH-E-3 – see Figure 3)

Welds	Description	Category/Item	Class
8, 10, 12	tubesheet-to-head	B-B/B2.60	1
7, 9, 11	tubesheet-to-shell	B-B/B2.80	1
1, 2, 3, 4, 5, 6	circumferential head	B-B/B2.51	1
13, 14, 15, 16, 17	nozzle-to-vessel	B-D/B3.150	1
18, 23, 24, 25, 26	nozzle-to-vessel	B-D/B3.150	1
27, 28	nozzle-to-vessel	B-D/B3.150	1
13NIR/14NIR/15NIR/16NIR	nozzle inside radius	B-D/B3.160	1
17NIR/18NIR/23NIR/24NIR	nozzle inside radius	B-D/B3.160	1
25NIR/26NIR/27NIR/28NIR	nozzle inside radius	B-D/B3.160	1

2. Applicable Code Editions and Addenda

North Anna Power Station Unit 1 is currently in the third period of the third interval and uses the 1989 Edition of the ASME Code. The third Inservice Inspection Interval started May 1, 1999 and is scheduled to end April 30, 2009.

North Anna Power Station Unit 2 is currently in the second period of the third interval and uses the 1995 Edition through 1996 Addenda of the ASME Code. The third Inservice Inspection Interval started December 14, 2001 and is scheduled to end December 13, 2010.

3. Applicable Code Requirements

ASME Section XI

- The 1989 Edition and 1995 Edition through 1996 Addenda, examination categories B-B and B-D (Inspection Program B) from Table IWB-2500-1 require that volumetric examinations be performed on welds and nozzle inside radius areas listed above.
- The 1989 Edition and 1995 Edition through 1996 Addenda, examination category C-A, Table IWC-2500-1 requires volumetric examinations are performed on welds listed above.
- The 1989 Edition and 1995 Edition through 1996 Addenda examination, category C-B from Table IWC-2500-1 requires surface examinations be performed on welds listed above.

4. Reason for Request

The regenerative heat exchanger (1/2-CH-E-3) provides preheat for the normal charging water flowing into the reactor coolant system (RCS). The residual heat removal heat exchanger is designed to cool the RCS during plant shut down operations. As part of the approval process for Code Case N-706-1 a feasibility study has been performed within the ASME and prepared by Westinghouse Owner's Group (WOG) project MUHP 5093, Working Group Inservice Inspection Optimization Action 97-01, ISI-03-06, BC03-338, "Technical Basis for Revision of Inspection Requirements for Regenerative and Residual Heat Exchangers," August, 2004. Technical justification for eliminating the surface and volumetric inspections of the residual heat removal and regenerative heat exchangers is provided in this report. The components at North Anna are typical of the heat exchangers described in the Westinghouse report on fabrication, geometric design, inspection requirements and geometric restrictions.

As stated in the Westinghouse report, these components were designed and installed before the imposition of the inservice inspection requirements by Section XI and are not designed for performance of ultrasonic and surface examination. The small diameter of the vessel and nozzles of the regenerative heat exchanger makes obtaining a

meaningful ultrasonic examination very time consuming and dose intensive. The physical limitations would substantially diminish the ability to discriminate flaw indications from geometry existing around the joint. Referring to the residual heat removal heat exchangers, interference with the lower support and interference with inlet and outlet piping leads to only partial coverage for examination of the head and shell circumferential welds.

Two other factors, flaw tolerance and risk assessment, presented in the Westinghouse report for these components were considered by the ASME committee. Fracture evaluations were performed for the components using finite element models and fracture calculations. It was concluded that the heat exchangers have a large flaw tolerance and that significant leakage would be expected long before any failure occurred. Fatigue crack growth was determined to be extremely slow even in the most highly stressed region. These heat exchangers do not have a severe duty cycle. Thus, detailed inspections are not required to ensure heat exchanger integrity.

A risk evaluation was performed using the accepted methodology applied for Risk Informed ISI piping inspection programs. The following conclusions were made:

- Safety equipment required to respond to the potential event is unaffected.
- Potential for loss of pressure boundary integrity is negligible.
- No safety analysis margins are changed.
- Leakage before full break is expected (i.e., there are no core damage consequences associated with leakage).

Thus, elimination of the subject inspections would not be expected to result in a significant increase in risk.

There have been no through-wall leaks on these components or components of similar design as reported in the industry and as discussed in the Westinghouse report. The only related leak in the United States occurred in January 2004 at San Onofre Unit 3 on the letdown line exiting the regenerative heat exchanger. This failure was caused by excessive vibration on the piping line and is not an indication of failure on the actual heat exchanger.

These heat exchangers were designed, constructed, and inspected to ASME Code rules. Since the Code required preservice exams, visual VT-2 examinations, in accordance with the system pressure test program have been performed in accordance with NRC approved relief requests.

Furthermore, these components are located in high radiation fields. The estimated personnel dose to perform interval Code inspections on the regenerative heat exchanger is 13 man-rem, and it is estimated that 4.5 man-rem would be required to meet the inspection requirements per interval for the residual heat removal heat exchanger. In view of the significant dose expenditure and limited examination results, performing the Code required examinations is not commensurate with the cost.

5. Proposed Alternative and Basis for Use

In accordance with the provisions of 10 CFR 50.55a(a)(3)(ii), approval is requested to use an alternative to the requirements of:

- Table IWB 2500-1 for Categories B-B and B-D pertaining to the regenerative heat exchanger
- Table IWC 2500-1 for Categories C-A and C-B pertaining to the residual heat removal heat exchangers

Specifically, a VT-2 examination is proposed to be performed as an acceptable alternative to the Code required examination. The VT-2 examination would be performed as part of the system leakage test (IWB-2500 and IWC-2500), which is required by examination categories B-P and C-H. Compliance with the Code required examination would result in hardship due to excessive personnel radiation exposure and geometric examination difficulties without a compensating increase in quality and safety.

6. Duration of Proposed Alternative

The use of alternative is for the duration of the North Anna Units 1 and 2 third Inservice Inspection Interval.

7. Precedents

Similar requests for relief from the above mentioned requirements were submitted and approved by the Nuclear Regulatory Commission for the North Anna Power Station Unit 2 second interval under TAC No. MB07050; Joseph M. Farley plant under TAC No. MA3449; Surry Power Station Unit 1, under TAC No. MB1998; and Surry Power Station Unit 2, under TAC No. MD2673.

8. References

ASME Code, Section XI, 1989 Edition
ASME Code, Section XI, 1995 Edition, including Addenda through 1996

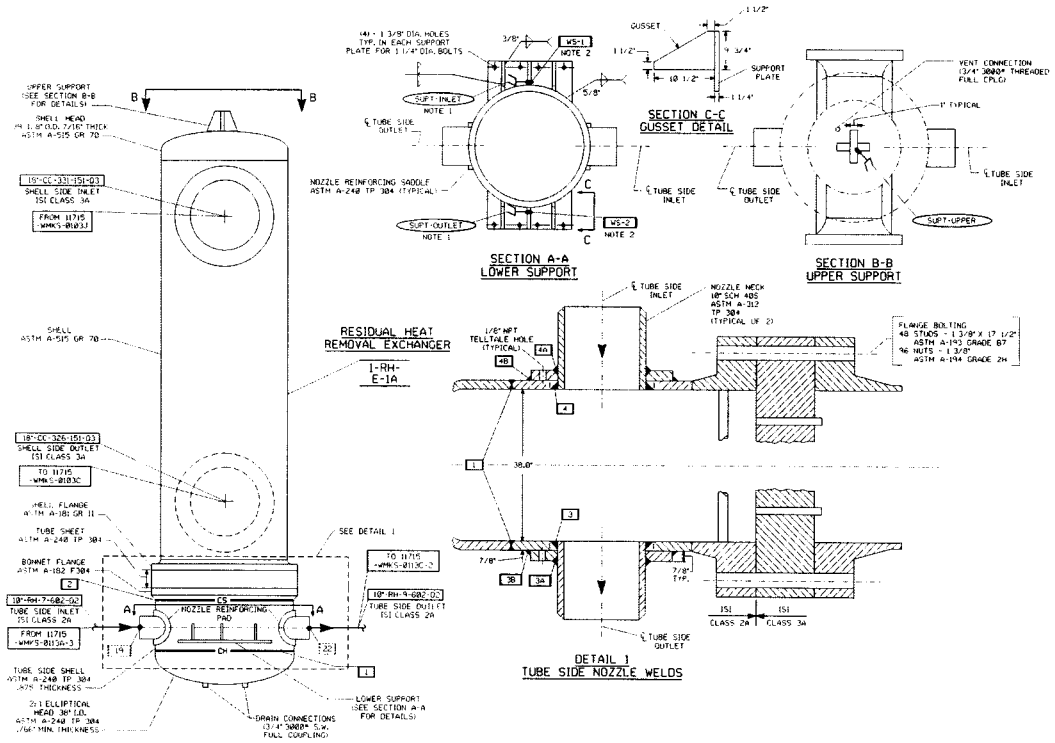

Figure 1: 11715/12050-WMKS-RH-E-1A/B

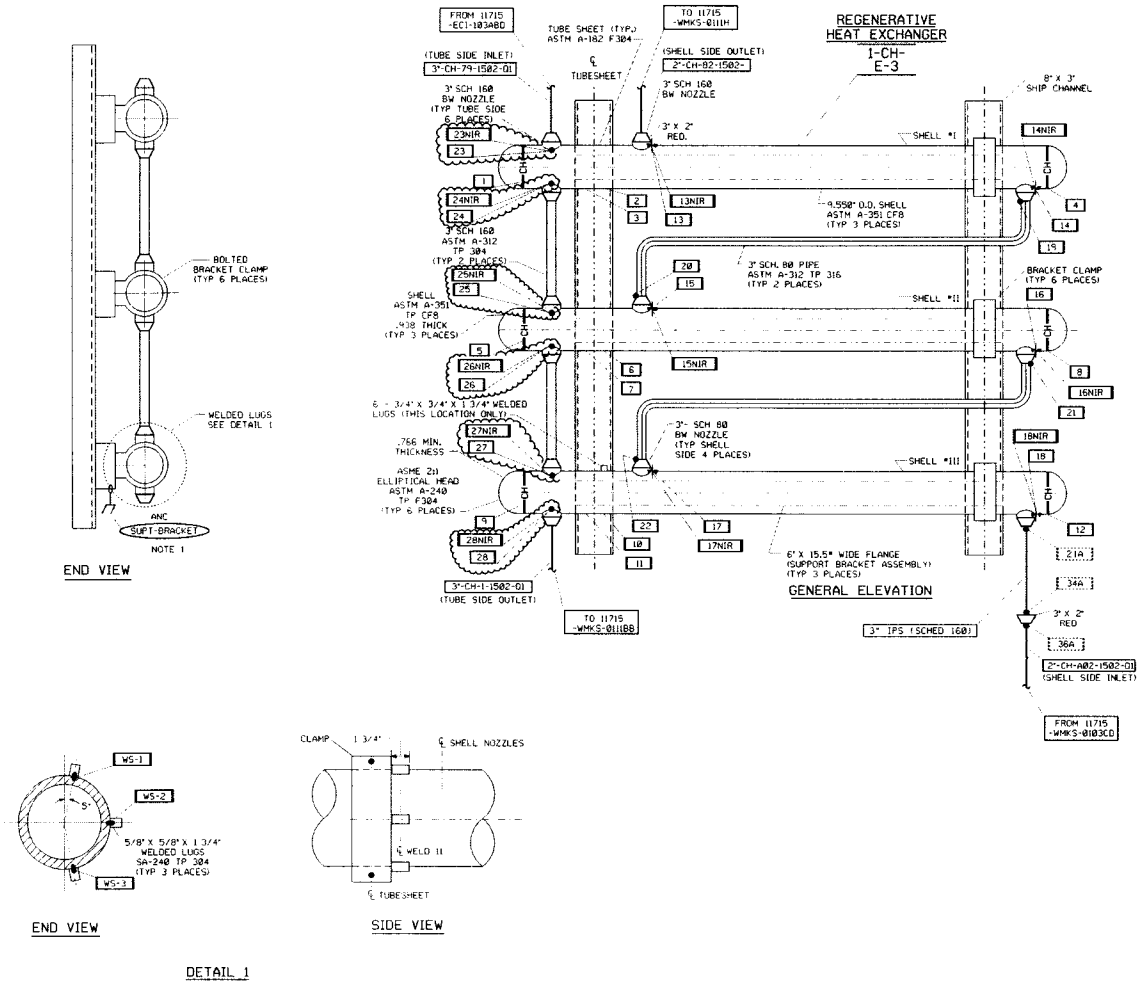

Figure 2: 11715-WMKS-CH-E-3

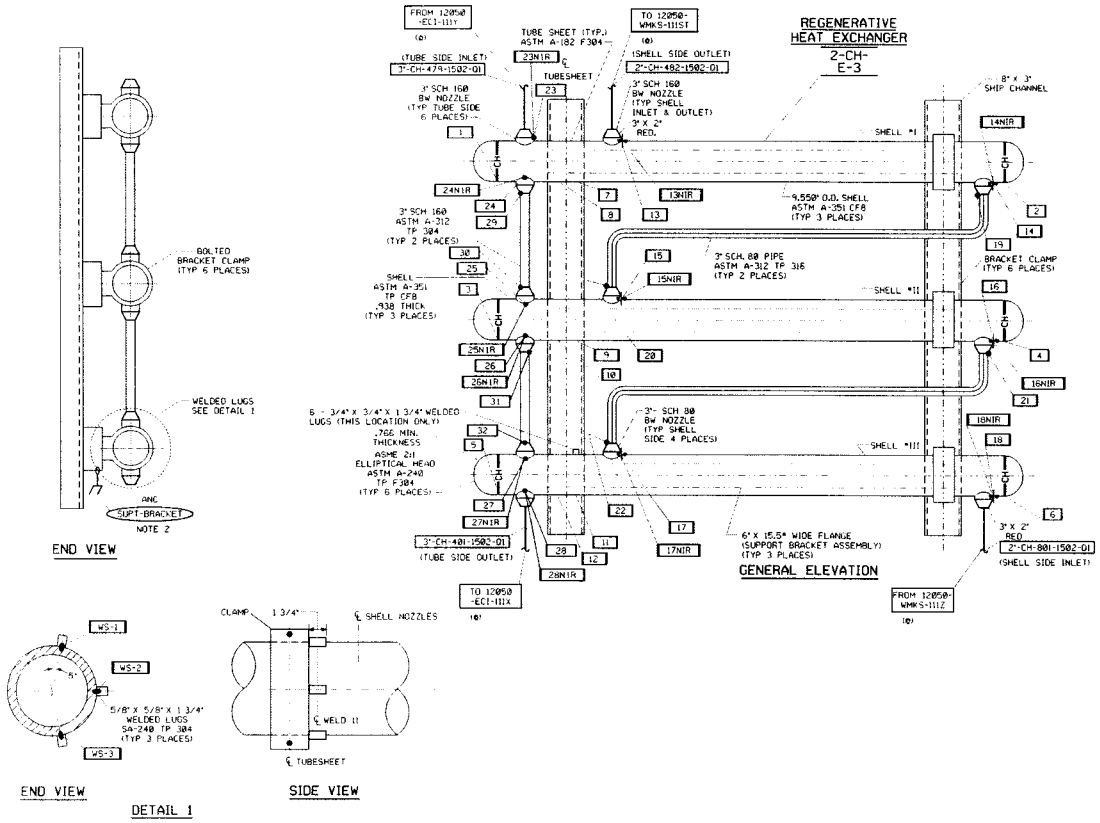

Figure 3: 12050-WMKS-CH-E-3