VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

February 9, 2006

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 06-057
NLOS/GDM R0
Docket No. 50-281
License No. DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 2
ASME SECTION XI INSERVICE INSPECTION PROGRAM
RELIEF REQUEST CMP-006 REVISION 1
REQUEST TO USE CODE CASE N-706 AS AN ALTERNATIVE

In a letter dated August 25, 2003 (Serial No. 03-428), Virginia Electric and Power Company (Dominion) submitted Relief Request CMP-006 for Surry Power Station Unit 2 pertaining to ASME Section XI Code required inspections on the Regenerative Heat Exchanger. In a subsequent letter to the NRC dated May 5, 2004 (Serial No. 03-428A), Dominion withdrew the subject relief request and noted our intent to resubmit the subject relief request at a later date.

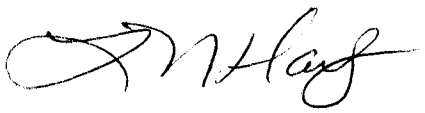
Since that time the ASME Boiler and Pressure Vessel Code Committee approved Code Case N-706, "Alternative Requirements to Table IWB and IWC 2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchangers Section XI, Division 1," on October 11, 2005. Code Case N-706 is not yet listed in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." However, provisions stated in footnote 6 to 10 CFR 50.55a provide for the use of other Code Cases upon request, if approved by the Director of the Office of Nuclear Reactor Regulation pursuant to 10 CFR 50.55a(a)(3).

Dominion has reviewed the Code Case and the Westinghouse report "Technical Basis for Revision of Inspection Requirements for Regenerative and Residual Heat Exchangers" prepared at the request of the Westinghouse Owner's Group (WOG). The Westinghouse paper was written to support the elimination of surface and volumetric inspections of the Residual and Regenerative Heat Exchangers by approval of this Code Case. Dominion has verified the application of the Code Case and technical basis for Surry Unit 2 in Relief Request CMP-006, Revision 1. The relief request is provided in Attachment 1, and a copy of Code Case N-706 is provided in Attachment 2. NRC approval of Relief Request CMP-006, Revision 1, is requested for the Surry Unit 2

Regenerative and Residual Heat Exchangers for the duration of the Fourth Inservice Inspection Interval pursuant to 10 CFR 50.55a(a)(3)(i).

If you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Very truly yours,



Leslie N. Hartz
Vice President – Nuclear Engineering

Attachments

Commitments made by this letter: None

cc: U. S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Mr. S. R. Monarque
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8H12
Rockville, MD 20852

Mr. N. P. Garrett
NRC Senior Resident Inspector
Surry Power Station

Mr. R. A. Smith
Authorized Nuclear Inspector
Surry Power Station

Attachment 1

Relief Request CMP-006, Revision 1

Virginia Electric and Power Company
(Dominion)
Surry Power Station Unit 2

RELIEF REQUEST CMP-006, REVISION 1

SURRY POWER STATION UNIT 2

I. IDENTIFICATION OF COMPONENTS

Various welds on the Residual (2-RH-E-1A and 2-RH-E-1B) and Regenerative Heat Exchangers (2-CH-E-3). The welds are:

2-RH-E-1A

Welds	Description	Category/Item	Class
1-A01	Head Circumferential Weld	C-A/C1.20	2
1-A02	Shell Circumferential Weld	C-A/C1.10	2
1-A05, 1-A06, 1-A07, 1-A08	Reinforcing Plate Welds to Nozzle and Vessel	C-B/C2.31	2

2-RH-E-1B

Welds	Description	Category/Item	Class
1-B01	Head Circumferential Weld	C-A/C1.20	2
1-B02	Shell Circumferential Weld	C-A/C1.10	2
1-B05, 1-B06, 1-B07, 1-B08	Reinforcing Plate Welds to Nozzle and Vessel	C-B/C2.31	2

2-CH-E-3

Welds	Description	Category/Item	Class
1-04, 1-17, & 1-19	Circumferential Head Welds	B-B/B2.51	1
1-03, 1-18, & 1-22	Tubesheet-to-Shell Welds	B-B/B2.80	1
1-06, 1-08, 1-09, 1-11, 1-13, & 1-15	Nozzle-to-Vessel Welds	B-D/B3.150	1
NIR-06, NIR-08, NIR-09, NIR-11, NIR-13, & NIR-15	Nozzle Inside Radius Section	B-D/B3.160	1
1-01, 1-21, & 1-24	Head Circumferential Welds	C-A/C1.20	2
1-02, 1-20, & 1-23	Tubesheet-to-Shell Welds	C-A/C1.30	2

II. APPLICABLE CODE EDITION AND ADDENDA

Surry Unit 2 is currently in the Fourth Inservice Inspection Interval under the 1998 Edition through the 2000 Addenda of the ASME Section XI Code.

III. CODE REQUIREMENTS

Examination Categories B-B and B-D from Table IWB-2500-1 and C-A and C-B from Table IWC-2500-1 require that volumetric or surface examinations be performed on the welds and nozzle inside radius areas listed above.

IV. BASIS FOR RELIEF

The subject welds are shown in Figures 1, 2 and 3 for stainless steel components 2-RH-E-1A, 2-RH-E-1B and 2-CH-E-3, respectively.

The regenerative heat exchanger (2-CH-E-3) provides preheat for the normal charging water flowing into the reactor coolant system (RCS). The residual heat exchangers are designed to cool the RCS during plant shut down operations.

On October 11, 2005, the ASME Boiler and Pressure Vessel Standards Committee approved Code Case N-706, "Alternative Examination Requirements of Table IWB-2500-1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchanger Section XI, Division 1" (Attachment 2). Westinghouse provided the technical justification for the Code Case for eliminating the surface and volumetric inspections of the Residual and Regenerative Heat Exchangers under the Westinghouse Owner's Group (WOG) project, "Technical Basis for Revision of Inspection Requirements for Regenerative and Residual Heat Exchangers", August, 2004. The components at Surry Power Station are typical of the heat exchangers described in the Westinghouse report by 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 ASME Section XI and are not designed for conducive performance of ultrasonic and surface examination. The small diameter of the vessel and nozzles of the Regenerative Heat Exchanger makes 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. Regarding the Residual Heat Exchangers, interference with the lower support and interference with inlet and outlet pipes would permit only partial coverage for examination of the head and shell circumferential welds.

Furthermore, these components are located in high radiation fields. The estimated personnel dose to perform interval Code inspections on the Regenerative Heat Exchanger is 12.0 man-rem. 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 dose expended for limited examination providing questionable results, the value of performing the Code required exams is minimal.

Two other factors presented in the Westinghouse report for these components were considered by the ASME committee: flaw tolerance and risk assessment. 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. 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 (no core damage consequences associated with leakage).

Consequently, 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 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.

V. PROPOSED ALTERNATIVE

In accordance with the provisions of 10CFR50.55a(a)(3)(i), approval is requested to use Code Case N-706 as an alternative to the requirements in Table IWB 2500-1 for Categories B-B and B-D pertaining to the Regenerative Heat Exchanger and Table IWC 2500-1 for Categories C-A and C-B pertaining to the Residual and Regenerative Heat Exchangers. Specifically, a VT-2 examination will be performed as an acceptable alternative to the Code required examination.

VI. DURATION OF PROPOSED ALTERNATIVE

The use of Code Case N-706 is requested for the duration of the Surry Unit 2 Fourth Inservice Inspection Interval or until the NRC publishes the Code Case for acceptable use in a future revision of Regulatory Guide 1.147.

VII. PRECEDENTS

Similar requests for relief were submitted and approved before this Code Case was approved by the ASME Section XI committee including Joseph M. Farley under TAC No. MA3449; North Anna Power Station Unit 2 under TAC No. MB07050; Surry Power Station Unit 1 for the third inservice inspection interval under TAC No. MB1998 and Surry Power Station Unit 2 for the third inservice inspection interval under TAC No. MB1999.

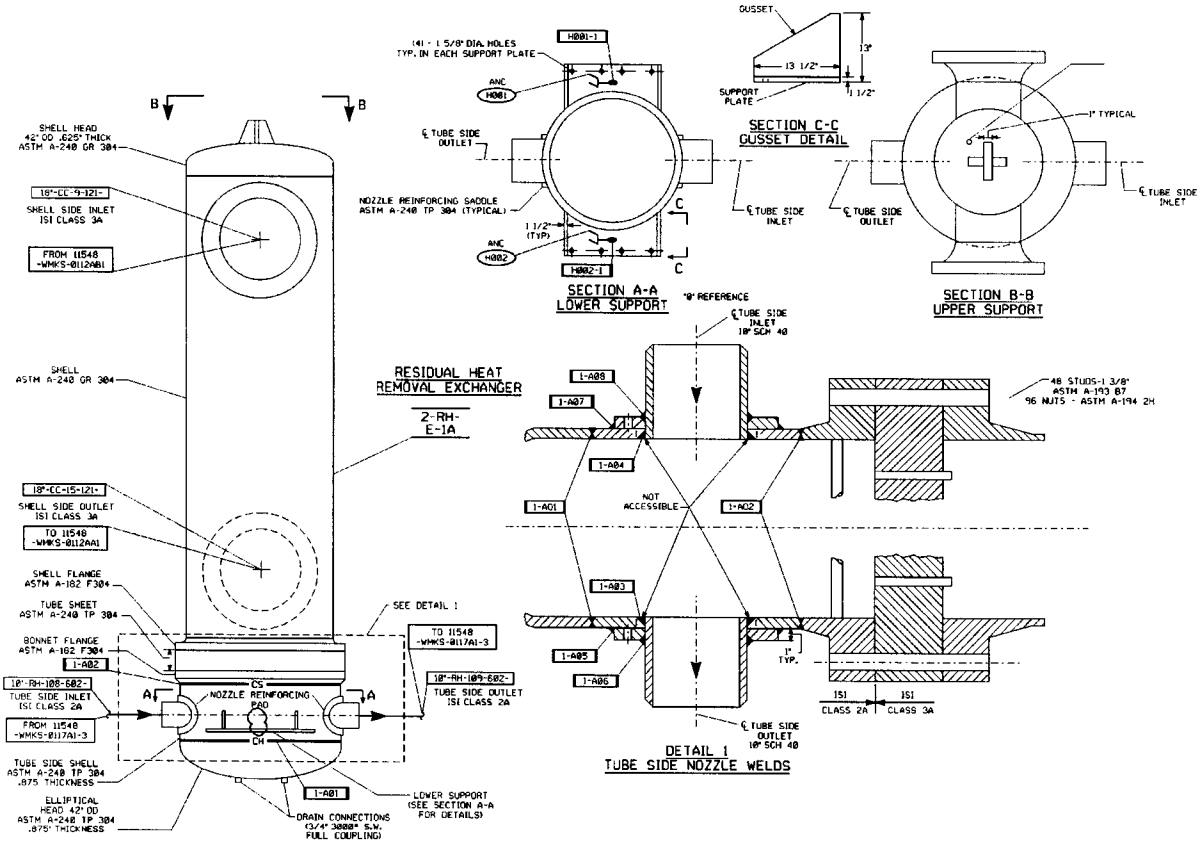


Figure 1 "A" Residual Heat Exchanger

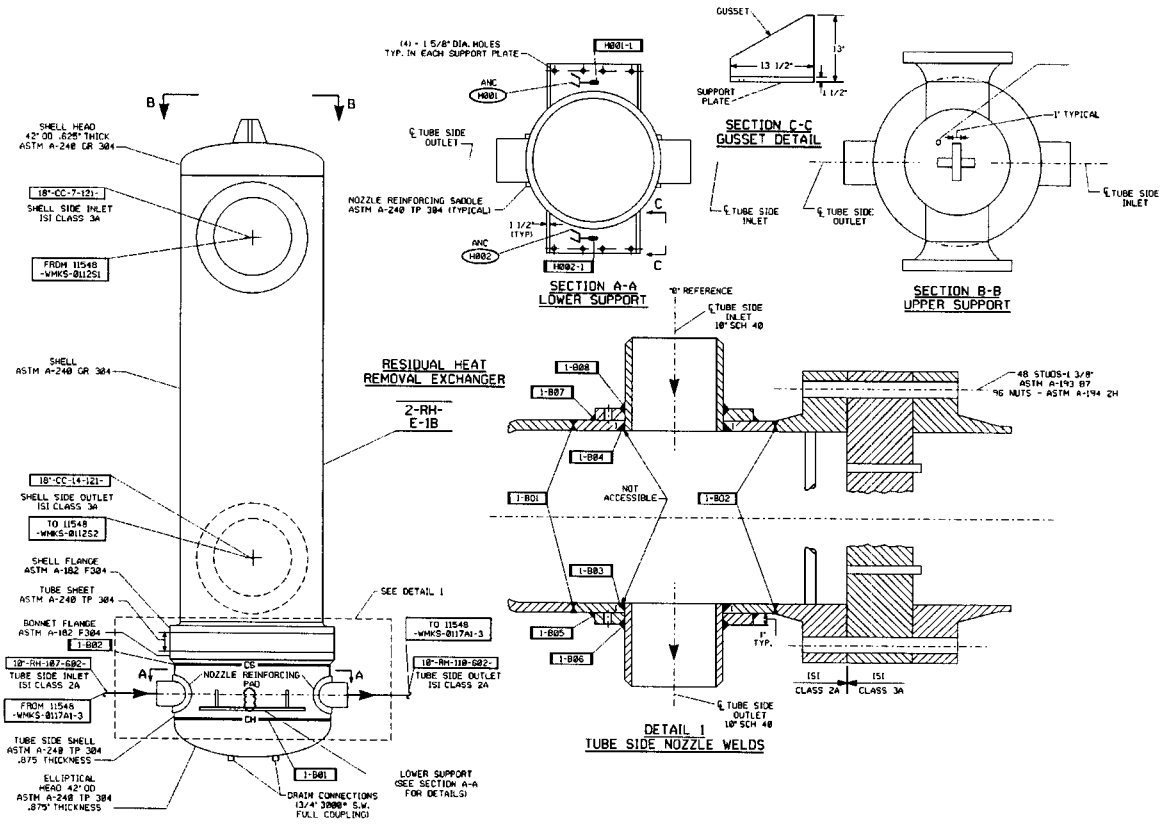


Figure 2 "B" Residual Heat Exchanger

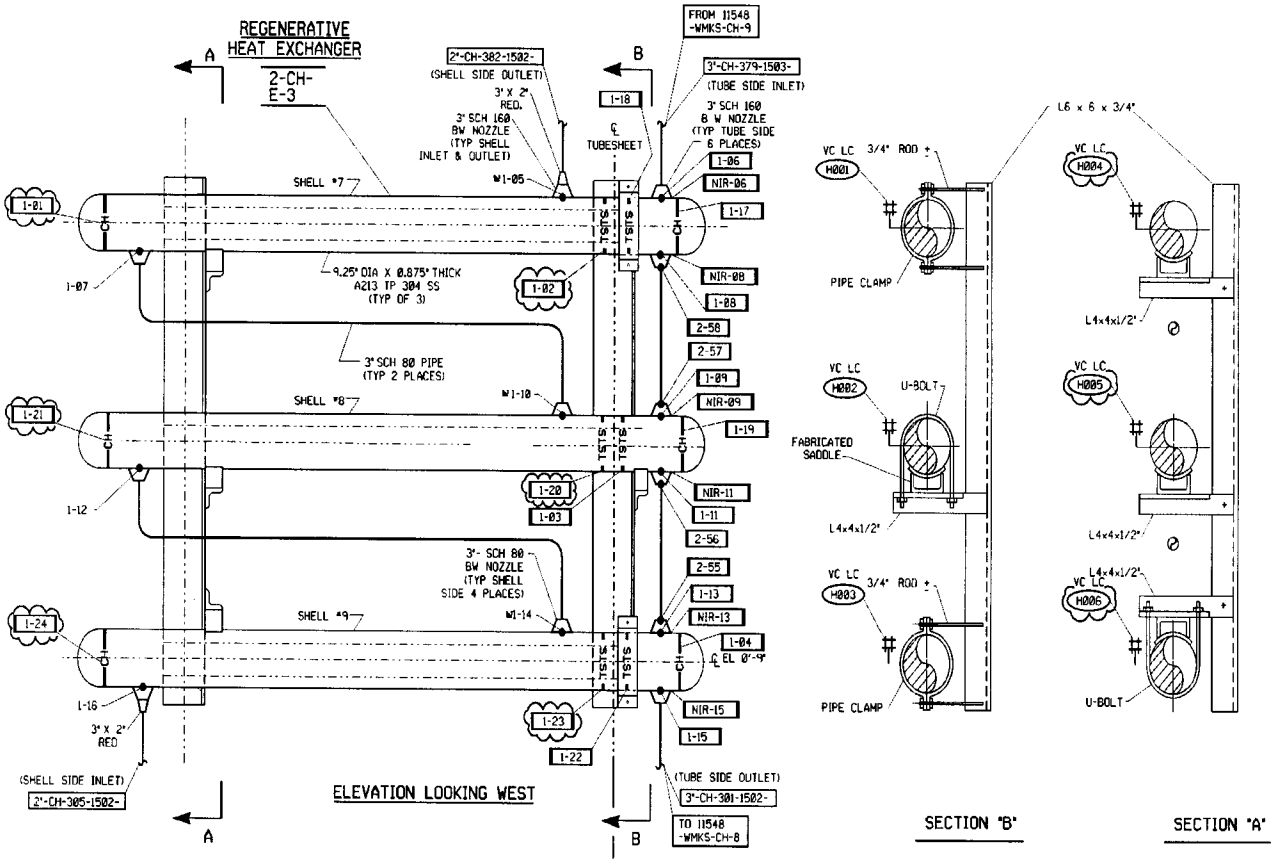


Figure 3 Regenerative Heat Exchanger

ATTACHMENT 2

Code Case N-706

Alternative Examination Requirements of Table IWB-2500-1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchanger Section XI, Division 1

Virginia Electric and Power Company
(Dominion)
Surry Power Station Unit 2

Case number: N-706

Footer: SUPP. 7 – NC (Status: ON)
PDF Footer: PDF RELEASE (Status: ON)

Approval Date: October 11 , 2005

The ASME Boiler and Pressure Vessel Standards Committee took action to eliminate Code Case expiration dates effective March 11, 2005. This means that all Code Cases listed in this Supplement and beyond will remain available for use until annulled by the ASME Boiler and Pressure Vessel Standards Committee.

Case N-706
Alternative Examination Requirements of Table IWB-2500-1 and Table IWC-2500-1 for PWR Stainless Steel Residual and Regenerative Heat Exchanger Section XI, Division 1

Inquiry: What alternative to the requirements of Table IWB-2500-1, Examination Categories B-B, B-D, and B-J, and Table IWC-2500-1, Examination Categories C-A, C-B, and C-F-1, may be used for PWR stainless steel regenerative and residual heat exchangers?

Reply: It is the opinion of the Committee that the requirements of Table 1 may be used for PWR stainless steel regenerative and residual heat exchangers, in lieu of the requirements of Table IWB-2500-1, Examination Categories B-B, B-D, and B-J, and Table IWC-2500-1, Examination Categories C-A, C-B, and C-F-1.

This Case may not be applied to any heat exchanger nor to any heat exchanger design or configuration that has experienced a through-wall leak, such as heat exchangers with an inner shell (inner barrel). The Owner shall evaluate industry experience to determine which heat exchanger designs or configurations have leaked. If any leakage is detected, it shall be corrected in accordance with IWA-4000 or (IWA-7000 prior to the 1991 Addenda). Use of this Case shall be discontinued for that heat exchanger design or configuration. The affected heat exchanger and others of the same design or configuration shall be examined in accordance with IWB-2500 or IWC-2500, as applicable.

TABLE 1
PRESSURE RETAINING WELDS IN PWR STAINLESS STEEL RESIDUAL AND REGENERATIVE HEAT EXCHANGERS

Item No.	Parts Examined	Examination Method	Acceptance Standard	Extent and Frequency of Examination		Deferral of Inspection to End of Interval
				First Inspection Interval	Successive Inspection Intervals	
1.10	Residual and Regenerative Heat Exchangers[1,2]					
1.11	Category B-B welds[3]	VT-2	IWB-3522	All welds	Same as for 1st interval	Not permissible
1.12	Category B-D welds[3]	VT-2	IWB-3522	All welds	Same as for 1st interval	Not permissible
1.13	Category B-J welds[3]	VT-2	IWB-3522	All welds	Same as for 1st interval	Not permissible
1.14	Category C-A welds[4]	VT-2	IWB-3516	All welds	Same as for 1st interval	Not permissible
1.15	Category C-B welds[4]	VT-2	IWB-3516	All welds	Same as for 1st interval	Not permissible
1.16	Category C-F-1 welds[4]	VT-2	IWB-3516	All welds	Same as for 1st interval	Not permissible

NOTES:

(1) Application of the requirements of this table is limited to those welds that are part of the as-received heat exchanger assembly. The regenerative heat exchanger assembly may be formed from multiple smaller heat exchanger subcomponents connected by sections of piping. All of the smaller heat exchanger subcomponents and the connecting piping are within the boundary of the heat exchanger assembly.

(2) All welds shall have received at least one volumetric examination; the preservice or Construction Code volumetric examination may be used to meet this requirement.

(3) Component shall be examined for evidence of leakage while undergoing the system leakage test (IWB-5220) as required by Examination Category B-P, to be performed every refueling outage.

(4) Component shall be examined for evidence of leakage while undergoing the system leakage test (IWC-5220) as required by Examination Category C-H, to be performed every inspection period.