VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

July 27, 2006

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

Serial No. 06-585
NLOS/GDM R1
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-007
REGENERATIVE AND RESIDUAL HEAT EXCHANGERS

In a letter dated February 9, 2006 (Serial No. 06-057), Virginia Electric and Power Company (Dominion) submitted Relief Request CMP-006, Revision 1, for Surry Power Station Unit 2 pertaining to ASME Section XI Code required inspections on the Regenerative and Residual Heat Exchangers. NRC approval was requested to use 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*, 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. However, it was subsequently determined that the Code Case requirement "All welds shall have received at least one volumetric examination..." could not be met for certain components on the Residual and Regenerative Heat Exchangers in that a volumetric examination was never a code requirement. Consequently, verbatim use of Code Case N-706 was not possible for all of the subject items included in the relief request. Discussions were held with the ASME Code Case writers and verification was made that the intent of the Code Case was to cover all of these heat exchanger components. A revision to the Code Case is now in the approval process, which will provide alternative examination requirements for all of the components included in this relief.

During a subsequent telephone conference call with the NRC, Dominion agreed to submit a separate relief request that did not rely upon Code Case N-706 rather than waiting on approval of the Code Case revision. Therefore, pursuant to 10CFR50.55a(a)(3)(ii), approval is requested to use an alternative to the requirements in Table IWB 2500-1 for Categories B-B and B-D associated with the Regenerative Heat Exchanger and Table IWC 2500-1 for Categories C-A and C-B associated with the Residual and Regenerative Heat Exchangers for complying with the code required examination. Compliance with the code requirements would result in a hardship

without a compensating increase in quality and safety due to the excessive personnel radiation exposure that would result from the performance of the examinations, as well as the geometric difficulties that would be encountered. The specified alternative and its supporting basis are provided in attached Relief Request CMP-007. Relief Request CMP-007 supercedes in its entirety the previously submitted Relief Request CMP-006, Revision 1.

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

Very truly yours,

G. T. Bischof
Vice President – Nuclear Engineering

Attachment

Commitments made in the letter: None

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Attachment

Relief Request CMP-007

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

RELIEF REQUEST CMP-007

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, B-D, from Table IWB-2500-1 and C-A, 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.

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 and Regenerative Heat Exchangers is supported in this report. The components at Surry Power Station (i.e., 2-RH-E-1A and 1B; 2-CH-E-3) are typical of the heat exchangers described 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 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 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 Exchangers, interference with the lower support and interference with inlet and outlet pipes leads to 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, and it is estimated that 4.5 man-rem would be required to meet the inspection requirements per interval for the Residual Heat Exchanger. In view of the significant dose required to be expended for limited examination providing questionable results, the value of performing the Code required examinations 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).

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 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.

All of these welds and the nozzle inner radius section have received some type of nondestructive examination during inservice or preservice inspection. The pressure retaining welds on the Regenerative Heat Exchanger received preservice volumetric examinations as outlined in the attached table. Since the preservice exams, visual VT-2 examinations have been performed in accordance with NRC approved relief requests. Some examinations were limited in coverage but these limitations would again create reduced coverage today. See Table 1 for Examination History.

V. PROPOSED ALTERNATIVE

In accordance with the provisions of 10CFR50.55a(a)(3)(ii), approval is requested to use 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. Complying with the code required examination would result in hardship without a compensating increase in quality and safety due to excessive personnel radiation exposure and geometric examination difficulties. 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 this relief request is for the duration of the Surry Unit 2 Fourth Inservice Inspection Interval.

VII. PRECEDENTS

Similar requests for relief were submitted and approved by the Nuclear Regulatory Commission for the Joseph M. Farley plant under TAC No. MA3449; North Anna Power Station Unit 2 under TAC No. MB07050; Surry Power Station Unit 1, third inservice inspection interval, under TAC No. MB1998; and Surry Power Station Unit 2, third inservice inspection interval under TAC No. MB1999.

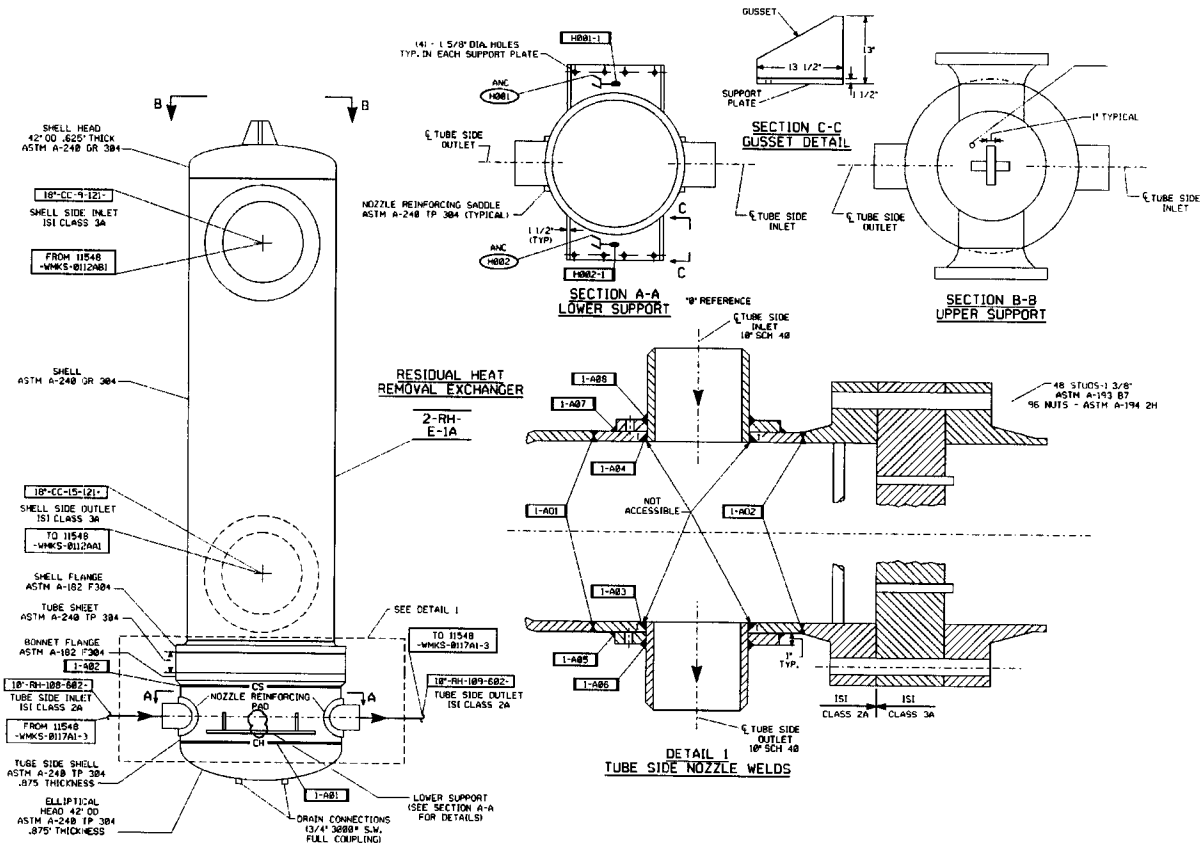

Figure 1 "A" Residual Heat Exchanger

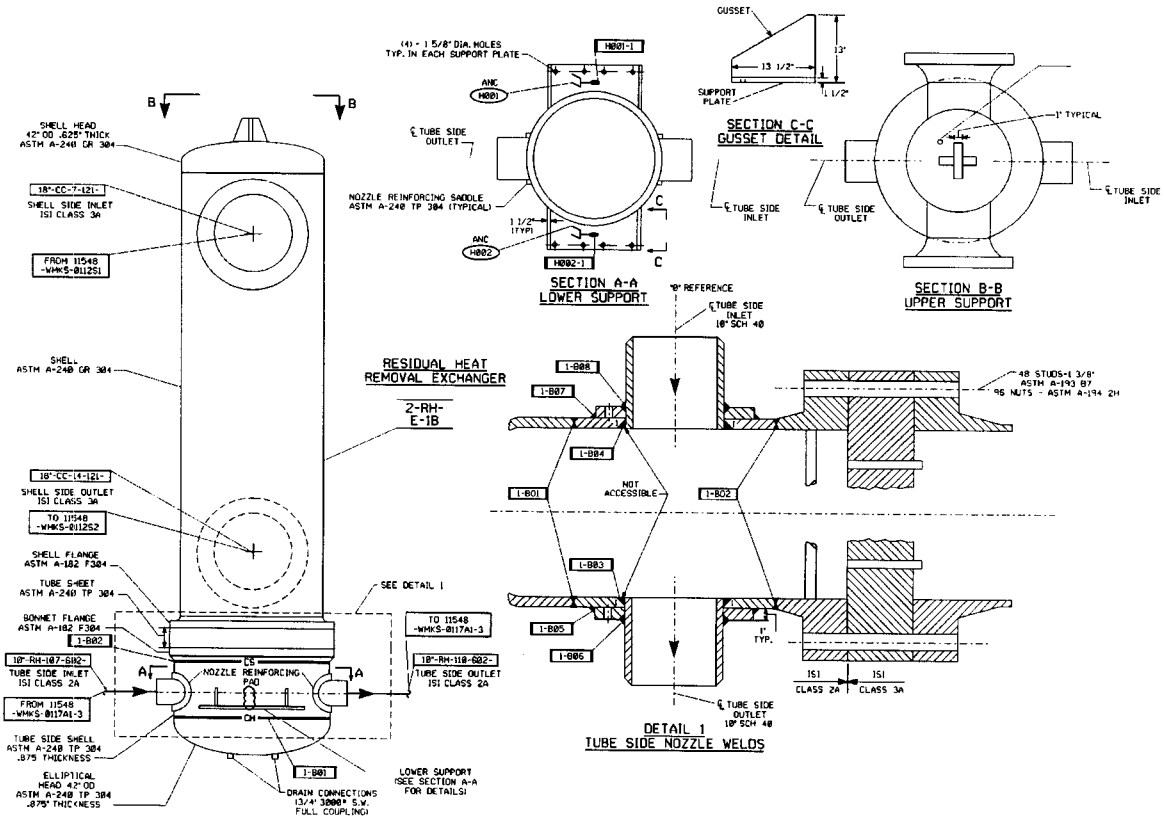

Figure 2 "B" Residual Heat Exchanger

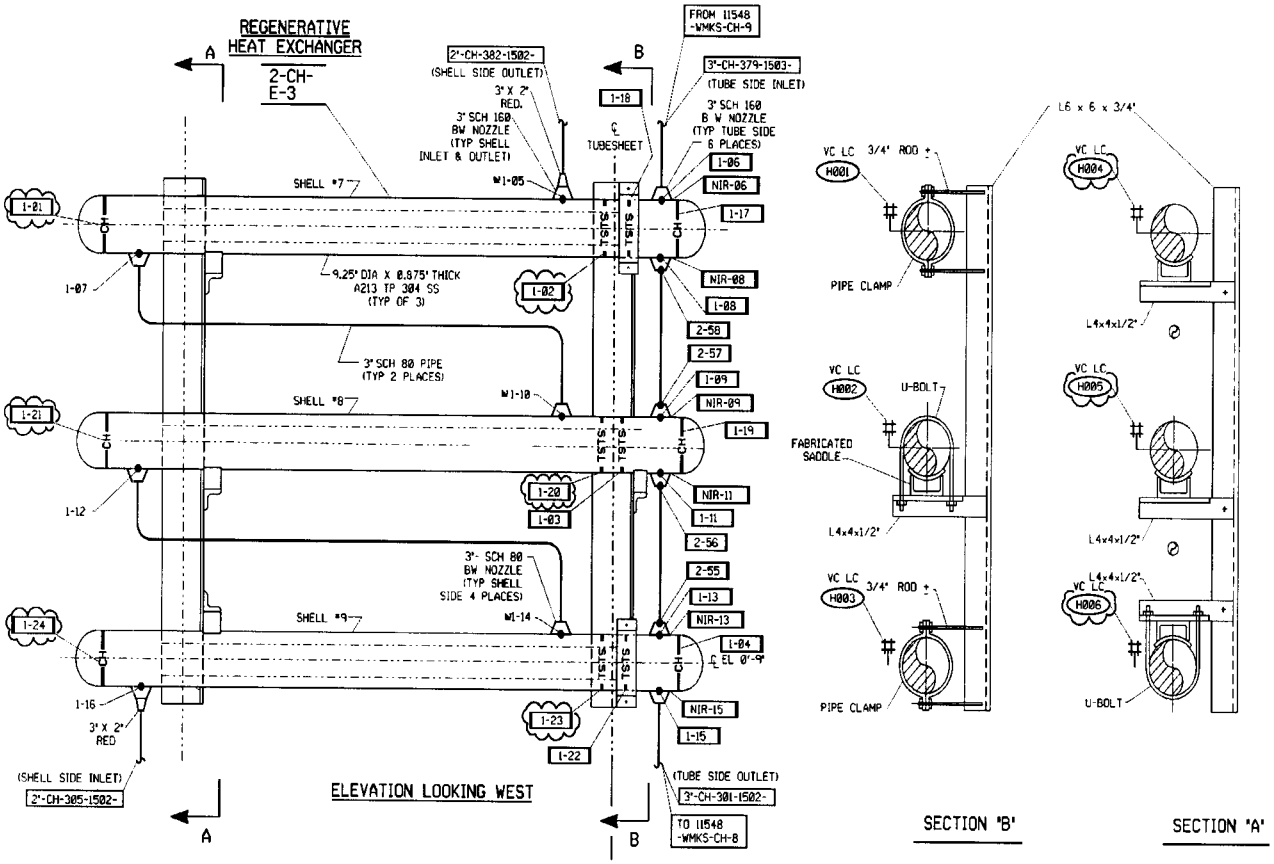

Figure 3 Regenerative Heat Exchanger

Table 1 Examination History					
Component	**Weld**	**Cat/Item**	**Description**	**Exam Date**	**Results/ Comments**
2-RH-E-1A	1-A01	C-A/C1.20	Head Circumferential Weld	03/06/1995 11/01/1988 10/06/2003	0" to 44" Indications dispositioned as geometrical. 44" to 88" No indications. 88" to 0" 91% coverage obtained, no indications.
2-RH-E-1A	1-A02	C-A/C1.10	Shell Circumferential Weld	03/6/1995 03/06/1995 10/06/2003	0" to 44" Indications dispositioned as geometrical. 44" to 66" No indications. 88" to 0" No indications.
2-RH-E-1B	1-B01	C-A/C1.20	Head Circumferential Weld	10/14/1986 10/11/2000 04/18/1993	0" to 44" No indications. 44" to 88" No Indications. 88" to 0" No indications, partial relief request SR-021 approved by NRC letter 94-271.
2-RH-E-1B	1-B02	C-A/C1.10	Shell Circumferential Weld	10/14/1986 10/11/2000 04/18/1993	22" to 44" No indications. 44" to 88" No indications. 110" to 0" No indications.
2-CH-E-3	1-04	B-B/B2.51	Circumferential Head Weld	11/30/1971	No indications.
2-CH-E-3	1-17	B-B/B2.51	Circumferential Head Weld	12/01/1971	No indications.
2-CH-E-3	1-19	B-B/B2.51	Circumferential Head Weld	12/01/1971	No indications.
2-CH-E-3	1-03	B-B/B2.80	Tubesheet-to-Shell Welds	12/01/1971	No indications. No coverage from 157° to 202° due to support bracket and nozzle configuration.
2-CH-E-3	1-18	B-B/B2.80	Tubesheet-to-Shell Weld	12/01/1971	No indications. Limited coverage upstream due to pipe hanger.
2-CH-E-3	1-22	B-B/B2.80	Tubesheet-to-Shell Weld	11/30/1971	Baffle plate indication noted due to ID geometry.

Component	Weld	Cat/Item	Description	Exam Date	Results/ Comments
2-CH-E-3	1-06	B-D/B3.150	Nozzle-to-Vessel Weld	12/01/1971	Indications due to ID geometry.
2-CH-E-3	1-08	B-D/B3.150	Nozzle-to-Vessel Weld	12/01/1971	Indications due to ID geometry.
2-CH-E-3	1-09	B-D/B3.150	Nozzle-to-Vessel Weld	12/01/1971	Indications due to ID geometry.
2-CH-E-3	1-11	B-D/B3.150	Nozzle-to-Vessel Weld	12/01/1971	Indications due to ID geometry.
2-CH-E-3	1-13	B-D/B3.150	Nozzle-to-Vessel Weld	11/30/1971	Indications due to ID geometry.
2-CH-E-3	1-15	B-D/B3.150	Nozzle-to-Vessel Weld	11/30/1971	Indications due to ID geometry.
2-CH-E-3	1-01	C-A/C1.20	Head Circumferential Weld	12/01/1971	No indications. No coverage upstream side from 135° to 225°and downstream from 120° to 240° due to brace.
2-CH-E-3	1-21	C-A/C1.20	Head Circumferential Weld	12/01/1971	No Indications. No coverage upstream side from 135° to 225° and downstream side from 120° to 240° due to hanger.
2-CH-E-3	1-24	C-A/C1.20	Head Circumferential Weld	11/30/1971	No indications. 80% of downstream side could not be examined due to interference with support clamp and brace.
2-CH-E-3	1-02	C-A/C1.30	Tubesheet-to-Shell Welds	12/01/1971	No indications. No coverage on downstream side due to pipe hanger.
2-CH-E-3	1-20	C-A/C1.30	Tubesheet-to-Shell Welds	12/01/1971	No indications. No coverage downstream side from 157° to 202° due to support bracket.
2-CH-E-3	1-23	C-A/C1.30	Tubesheet-to-Shell Welds	11/30/1971	Indications due to ID geometry.

*Preoperational baseline UT examinations performed between November 1971 and November 1972.

The following are Nozzle Inner Radius Sections and are not pressure retaining welds. All received satisfactory VT-2 exams in accordance with Relief Request SR-018 for the 2nd Interval and in accordance with Relief Request SR-029 for the 3rd Interval as shown.

Component	Mark #	Cat/Item	2nd Interval Exam Date	3rd Interval Exam Date
2-CH-E-3	NIR-06	B-D/B3.160	03/19/1995	06/04/1996
2-CH-E-3	NIR-08	B-D/B3.160	03/19/1995	06/04/1996
2-CH-E-3	NIR-09	B-D/B3.160	03/19/1995	10/29/2000
2-CH-E-3	NIR-11	B-D/B3.160	03/19/1995	10/29/2000
2-CH-E-3	NIR-13	B-D/B3.160	03/19/1995	04/18/2002
2-CH-E-3	NIR-15	B-D/B3.160	03/19/1995	04/18/2002

The following are reinforcing plate welds for the nozzle to vessel on the Residual Heat Removal Heat Exchanger and received surface examinations (liquid penetrant) as required by code on the dates shown:

Component	Mark #	Category/Item	Method	Exam Date	Results
2-RH-E-1A	1-A05	C-B/C2.31	PT	03/06/1995	No Indications
2-RH-E-1A	1-A06	C-B/C2.31	PT	10/23/2003	No Indications
2-RH-E-1A	1-A07	C-B/C2.31	PT	10/14/2003	Initial indication removed within acceptable grinding limits for grooming. No repair necessary. Evaluated by ET-CM-03-0025.
2-RH-E-1A	1-A08	C-B/C2.31	PT	10/15/2003	Initial indication found acceptable by volumetric acceptance criteria.
2-RH-E-1B	1-B05	C-B/C2.31	PT	10/22/2003	No indications
2-RH-E-1B	1-B06	C-B/C2.31	PT	10/22/2003	No indications
2-RH-E-1B	1-B07	C-B/C2.31	PT	10/24/2003	Initial indication removed within acceptable grinding limits for "grooming". No repair necessary. Evaluated by ET-CM-03-0025.
2-RH-E-1B	1-B08	C-B/C2.31	PT	10/24/2003	Initial indication removed within acceptable grinding limits for "grooming". No repair necessary. Evaluated by ET-CM-03-0025.