September 28, 2005

Mr. David A. Christian
Sr. Vice President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, Virginia 23060-6711

SUBJECT: SURRY POWER STATION, UNIT 1 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) SECTION XI INSERVICE INSPECTION (ISI) PROGRAM, PARTIAL EXAMINATION RELIEF REQUESTS (TAC NOS. MC4633, MC4634, MC4635, MC4636, AND MC4637)

Dear Mr. Christian:

By letter dated October 11, 2004, as supplemented by letter dated July 14, 2005, Virginia Electric and Power Company (VEPCO) requested relief from the ASME Code, Section XI requirements for the third 10-year ISI interval at Surry Power Station (Surry), Unit 1. In this submittal, VEPCO requested Nuclear Regulatory Commission (NRC) staff approval of Relief Requests PRT-02 through PRT-06.

Our evaluation of Relief Requests PRT-02 through PRT-06 is enclosed. For Requests for Relief PRT-02, PRT-03, and PRT-06, the NRC staff has determined that the ASME Code-required examinations are impractical to perform because the design of the various components limits access to perform the required examinations. The NRC staff concludes that the limited examinations performed by VEPCO provide reasonable assurance of structural integrity of the subject components. Therefore, VEPCO's Relief Requests PRT-02, PRT-03, and PRT-06 are granted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i) for the third 10-year ISI Interval at Surry, Unit 1. The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and 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.

Regarding Request for Relief PRT-04, the NRC staff has determined that VEPCO's proposed alternative provides an acceptable level of quality and safety. Therefore, VEPCO's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval at Surry, Unit 1.

For Request for Relief PRT-05, Revision 1, the NRC staff has determined that the ASME Code-required examinations would cause significant hardship without a compensating increase in the level of quality and safety. VEPCO's proposed alternative provides reasonable assurance of structural integrity of the subject components. Therefore, VEPCO's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval at Surry, Unit 1.

The NRC staff is closing out TAC Nos. MC4633, MC4634, MC4635, MC4636, and MC4637 with this letter.

Sincerely,

/RA/
Evangelos Marinos, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-280

Enclosure: As stated

cc w/encl: See next page

The NRC staff is closing out TAC Nos. MC4633, MC4634, MC4635, MC4636, and MC4637 with this letter.

Sincerely,

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Docket No. 50-280

Enclosure: As stated

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUESTS PRT-02 THROUGH PRT-06

SURRY POWER STATION, UNIT 1

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

1.0 INTRODUCTION

By letter dated October 11, 2004, as supplemented by a letter dated July 14, 2005, Virginia Electric and Power Company (the licensee) submitted relief requests PRT-02 through PRT-06 for the third 10-year inservice inspection (ISI) interval at Surry Power Station, Unit 1. The Nuclear Regulatory Commission (NRC) staff, with technical assistance from its contractor, the Pacific Northwest National Laboratory (PNNL), has evaluated the information provided by the licensee. As a result, the NRC staff adopts the evaluations and recommendations for granting or authorizing relief contained in PNNL's Technical Letter Report (TLR), included as Attachment 2 of this Safety Evaluation (SE). Attachment 1 of this SE lists each relief request and the status of approval.

2.0 REGULATORY REQUIREMENTS

Inservice inspection of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by Title 10 of the *Code of Federal Regulation* (10 CFR) Section 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the Director of the Office of Nuclear Reactor Regulation, if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to

the limitations and modifications listed therein. The ASME Code of record for the Surry Power Station, Unit 1 third 10-year interval ISI program, is the 1989 Edition of Section XI of the ASME B&PV Code with no addenda.

3.0 TECHNICAL EVALUATION

The NRC staff, with technical assistance from its contractor, PNNL, has reviewed and evaluated the information provided by the licensee in its letter dated October 11, 2004, which proposed its third 10-Year interval ISI program plan, Requests for Relief PRT-02 through PRT-06 for Surry Power Station, Unit 1. In response to a NRC request for additional information, the licensee provided additional information in its letter dated July 14, 2005. The NRC staff adopts the evaluations and recommendations for granting or authorizing relief contained in PNNL's TLR.

For Requests for Relief PRT-02, PRT-03, and PRT-06, the NRC staff found that the ASME Code requirements are impractical because the design of the various components, limits access to perform the ASME Code-required surface or volumetric examinations. In order for the licensee to meet the ASME Code requirements, the subject components would have to be redesigned and modified and this would result in a significant burden on the licensee.

For Request for Relief PRT-02, clevis plate attachment welds H003-1 and H003-2 are partially covered by permanent, clam-shell enclosure pipes that have been circumferentially welded to the carbon steel piping pressure boundary. The licensee obtained 100 percent surface coverage of the circumferential welds attaching the encapsulation segments to the pressure boundary outside surface. In addition, the licensee examined approximately 42 percent of the clevis plate attachment welds accessible from the outside of the clam-shell support.

For Request for Relief PRT-03 clevis plate attachment weld H002-1 is fully covered by permanent, clam-shell enclosure pipes that have been circumferentially welded to the carbon steel piping pressure boundary. The licensee obtained 100 percent surface coverage of the circumferential welds attaching the encapsulation segments to the pressure boundary outside surface, but was unable to examine any of the clevis plate attachment welds from the outside of the clam-shell support.

For Request for Relief PRT-06 pertaining to the head-to-shell weld in the residual heat removal (RHR) heat exchanger, the licensee had to subdivide the examination by two-thirds in the "A" heat exchanger and one-third in the "B" heat exchanger due to obstructions caused by other components. The licensee was able to obtain a substantial aggregate coverage of approximately 81 percent of the ASME Code-required volume. This is permissible under the ASME Code for multiple vessels of similar design in Examination Category C-A.

For all of the ASME Code examinations in Requests for Relief PRT-02, PRT-03, and PRT-06, the licensee did not find any recordable indications on any of the examined weld surfaces or the volumes. Based on the coverages obtained, the NRC staff determined that if any significant patterns of service-induced degradation were present in the subject clevis plate attachment welds or RHR heat exchanger head-to-shell welds, there is reasonable assurance that evidence of it would have been detected by the examinations performed. Therefore, the examinations performed provided reasonable assurance of structural integrity of the subject clevis plate attachment welds and head-to-shell welds at the RHR heat exchangers.

For Request for Relief PRT-04, the examination requirements for the piping welds 1-05 and 1-11 contained in line segment ECC-002 are governed by the risk-informed ISI program. The licensee was unable to obtain full volumetric coverage of the subject welds due to the material type (cast stainless steel) and the configuration of the piping and components. The licensee, however, as an alternative performed 100 percent volumetric examination of an adjacent pipe-to-pipe weld (1-08) and did not detect inservice degradation. Therefore, the NRC staff determined that the licensee's proposed alternative provides a reasonable assurance of quality and safety.

For Request for Relief PRT-05 the NRC staff determined that the ASME Code-required volumetric examination for pressurizer (PZR) shell-to-head weld 1-07 and longitudinal shell weld 1-15 cannot be performed due to scan restrictions caused by component support columns and lugs, instrument nozzles and a vessel insulation support ring. In order for the licensee to perform the ASME Code-required examination, the support and instrumentation appurtenances would have to be disassembled and removed. The licensee estimates radiation exposure to workers would be approximately 18 man-rem to accomplish these tasks. Therefore, the NRC staff determined that to remove the subject components would place a significant burden on the licensee and would be a significant hardship without a compensating increase quality and safety.

As part of Request for Relief PRT-05, the licensee proposed as an alternative that the examinations for the subject PZR welds completed be considered to meet the ASME Code requirements. Using 45 and 60 degree shear wave methods, the licensee obtained greater than 80 percent of the ASME Code-required examination volume for circumferential shell-to-head weld 1-07 from the head side and approximately 60 percent of the required volume from each side of intersecting longitudinal weld 1-15. Therefore, the NRC staff determined that if significant patterns of service-induced degradation were present in the subject PZR welds there is reasonable assurance that evidence of degradation would have been detected by the examinations performed.

4.0 CONCLUSION

The Requests for Relief PRT-02 through PRT-06 from the requirements of Section XI of the ASME Code have been reviewed by the NRC staff with the assistance of its contractor, PNNL. The TLR included as Attachment 2 of this SE provides PNNL's evaluation of these requests for relief. The NRC staff has reviewed the contractor's TLR and adopts the evaluations and recommendations for granting or authorizing Requests for Relief PRT-02 through PRT-06. Attachment 1 of this SE lists each relief request and the status of approval.

For Requests for Relief PRT-02, PRT-03, and PRT-06, the NRC staff concluded that the ASME Code-required examinations are impractical to perform because the design of the various components limits access to perform the required examinations. In order to perform the examinations, the subject components would have to be redesigned, thus, placing a significant burden on the licensee. The NRC staff concluded that the limited examinations performed were adequate to identify significant patterns of service-induced degradation and provide reasonable assurance of structural integrity of the subject components. Therefore, the licensee's Requests for Relief PRT-02, PRT-03, and PRT-06 are granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year ISI Interval at Surry Power Station, Unit 1. The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and 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.

For Request for Relief PRT-04, the NRC staff concluded that the licensee's proposed alternative to additionally perform 100 percent volumetric examination of an adjacent pipe-to-pipe weld (1-08) provides an acceptable level of quality and safety and the alternative was adequate to identify significant patterns of service-induced degradation. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval.

For Request for Relief PRT-05, Revision 1, the NRC staff concluded that the ASME Code-required examinations would cause significant hardship without a compensating increase in the level of quality and safety. The licensee's proposed alternative was adequate to identify significant patterns of service-induced degradation and provides reasonable assurance of structural integrity of the subject components. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval.

All other requirements of the ASME Code, Sections III and XI for which relief has not been specifically requested remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

Attachments: 1. Summary of Relief Requests
2. Technical Letter Report, Pacific Northwest National Laboratory

Principal Contributor: T. McLellan

Date: September 28, 2005

TECHNICAL LETTER REPORT

ON THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

REQUESTS FOR RELIEF NOS. PRT-02 THROUGH PRT-06

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)

SURRY POWER STATION, UNIT 1

DOCKET NUMBER 50-280

1.0 SCOPE

By letter dated October 11, 2004, the licensee, Virginia Electric and Power Company (Dominion), submitted Requests for Relief PRT-02 through PRT-06 from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*. The requests are for the third 10-year inservice inspection (ISI) interval at Surry Power Station, Unit 1 (Surry 1). As a result of a U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI), Dominion provided further information and revised one request in a letter dated July 14, 2005. Pacific Northwest National Laboratory (PNNL) has evaluated the requests for relief and supporting information submitted by the licensee in Section 3.0 below.

2.0 REGULATORY REQUIREMENTS

Inservice inspection of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (B&PV Code), and applicable addenda, as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulation at 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the licensee demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, which was incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ASME Code of record for the Surry 1 third 10-year interval ISI program is the 1989 Edition of ASME Section XI, with no Addenda.

3.0 TECHNICAL EVALUATION

The information provided by Virginia Electric and Power Company in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below.

3.1 Request for Relief PRT-02, Examination Category C-C, Integral Attachments for Vessels, Piping, Pumps and Valves

ASME Code Requirement: Examination Category C-C, Item C3.20 requires 100% surface examination, as defined in Figure IWC-2500-5, for integrally welded attachments on Class 2 piping. ASME Code Case N-460, as an alternative approved for use by the NRC Staff, states that a reduction in examination coverage due to part geometry or interference for any Class 1 and 2 weld is acceptable provided that the reduction is less than 10%, i.e., greater than 90% examination coverage is obtained.

Licensee's ASME Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the ASME Code surface examination coverage requirements for Surry 1 integral attachment Welds H003-1 and H003-2 on the Main Steam piping system.

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

The component support has multiple integrally attached welds as shown in the sketches on pages 3 and 4[1]. One portion consists of two clevis type attachments that were welded to the pipe prior to the installation of two clam shell type pieces that were assembled over the attachments. The two clam shell pieces were welded together with two longitudinal welds and then attached to the pressure boundary with two circumferential welds. One hundred percent (100%) coverage of the two circumferential welds was obtained [using magnetic particle testing]. Forty-two percent (42%) of the welds associated with the clevis attachments were accessible and examined [with liquid penetrant testing] resulting in a net total coverage of 75% for the whole component.

The purpose of nondestructive examination (NDE) is to perform inspections without destroying the component. Permanent removal of the exterior protective shell would be required to render all welds in question accessible for any type of NDE exam, which is contrary to the intent of the code. In fact, more recent editions of Article IWC-1000, such as the 1998 Edition through 2000 Addendum, define "Inaccessible Welds" under IWC-1223 as "Welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by guard pipe." Thus, these portions of welds would be classified as inaccessible by later code editions and would be exempt from the requirements of IWC.

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1. Sketches provided by the licensee are not included in this report.

Licensee's Proposed Alternative Examination (as stated):

The component receives periodic VT-2 examinations in accordance with Category C-H, which should detect any through wall leakages in the inaccessible areas. No alternative NDE methods could provide additional data, and no alternative component may be selected to meet the 100% requirement for pipe integral attachments. Destruction of the component would be necessary to perform 100% of the code required exam as written in the 1989 ASME Section XI Code Edition and is contrary to the intent of the code.

Therefore, Dominion requests relief from performing the Code-required surface exam on the inaccessible parts of this integral attachment in accordance with 10 CFR 50.55a(g)(6)(i) since examination in this area is impractical. The VT-2 examination is an acceptable means for detecting through-wall leakage.

Evaluation: The ASME Code requires 100% surface examination of integral attachment welds installed on Class 2 piping systems during each inspection interval. However, the support configuration and design of the subject attachments prevent access to examine a portion of the attachment welds. In order to fully examine the entire integral attachments welded to the pressure boundary of these piping supports, the encapsulation cylinder would have to be removed, which could only be accomplished by cutting the existing circumferential and longitudinal welds out, and re-welding these components after examining the currently inaccessible portions of the attachment welds. Consequently, the ASME Code-required 100% examination of the subject integral attachment welds is impractical.

The figures[2] provided by the licensee demonstrate that clevis plate attachment welds H003-1 and H003-2 are partially covered by permanent, clam-shell enclosure pipes that have been circumferentially welded to the carbon steel piping pressure boundary. The licensee obtained 100% surface coverage of these circumferential welds attaching the encapsulation segments to the pressure boundary outside surface, and was able to examine approximately 42% of the clevis plate attachment welds accessible from the outside of the clam-shell support. No relevant flaws were detected during these examinations. Based on the coverages obtained, if significant patterns of service-induced degradation were present in the subject integral attachments, there is reasonable assurance that evidence of it would have been detected by the examinations performed.

Therefore, considering the impracticality of performing the ASME Code-required 100% surface examinations, and the examination coverages obtained on the subject integrally welded attachments, it is recommended that relief be granted for the third interval at Surry 1, pursuant to 10 CFR 50.55a(g)(6)(i).

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2. Figures depicting the design and limited access for the subject welds are not included in this report.

3.2 Request for Relief PRT-03, Examination Category C-C, Integral Attachments for Vessels, Piping, Pumps and Valves

ASME Code Requirement: Examination Category C-C, Item C3.20 requires 100% surface examination, as defined in Figure IWC-2500-5, for integrally welded attachments on Class 2 piping. ASME Code Case N-460, as an alternative approved for use by the NRC Staff, states that a reduction in examination coverage due to part geometry or interference for any Class 1 and 2 weld is acceptable provided that the reduction is less than 10%, i.e., greater than 90% examination coverage is obtained.

Licensee's ASME Code Relief Request: In accordance with 10CFR50.55a(g)(5)(iii), the licensee requested relief from the ASME Code surface examination coverage requirement for Surry 1 integral attachment Weld H002-1 on the Main Steam piping system.

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

The component support has multiple integrally attached welds as shown in the sketches on page 3[3]. One portion consists of two clevis type attachments that were welded to the pipe prior to the installation of two clam shell type pieces that were assembled over the attachments. The two clam shell pieces were welded together with two longitudinal welds and then attached to the pressure boundary with two circumferential welds, thus rendering the clevis welds totally inaccessible. One hundred percent (100%) of the examination surface for the circumferential welds was obtained using magnetic particle and liquid penetrant examination methods. Zero percent (0%) of the welds associated with the clevis attachments were examined resulting in a net total of 89% coverage for the component.

The purpose of nondestructive examination (NDE) is to perform inspections without destroying the component. Permanent removal of the exterior protective shell would be required to render all welds in question accessible for any type of NDE exam, which is contrary to the intent of the code. In fact, more recent editions of Article IWC-1000, such as the 1998 Edition through 2000 Addendum, define "Inaccessible Welds" under IWC-1223 as "Welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by guard pipe." Thus, these portions of welds would be classified as inaccessible by later code editions and would be exempt from the requirements of IWC.

Licensee's Proposed Alternative Examination:(as stated):

The component receives periodic VT-2 examinations in accordance with Category C-H, which should detect any through wall leakages in the inaccessible areas. No alternative NDE methods could provide additional data, and no alternative component may be selected to meet the 100% requirement for pipe integral attachments. Destruction of the component would be necessary to perform 100% of the code required exam as written in the 1989 ASME Section XI Code Edition and is contrary to the intent of the code.

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3. Sketches provided by the licensee are not included in this report.

Therefore, Dominion requests relief from performing the code required surface exam on the inaccessible parts of this integral attachment in accordance with 10 CFR 50.55a(g)(6)(i) since examination in this area is impractical. The VT-2 examination is an acceptable means for detecting through-wall leakage.

Evaluation: The ASME Code requires 100% surface examination of integral attachment welds installed on Class 2 piping systems during each inspection interval. However, the support configuration and design of the attachment prevents access to examine a portion of the attachment welds. In order to fully examine all the integral attachments welded to the pressure boundary of this piping support, the encapsulation cylinder would have to be removed, which could only be accomplished by cutting the existing circumferential and longitudinal welds out, and re-welding these components after examining the currently inaccessible portions of the attachment weld. Consequently, the ASME Code-required 100% examination of the subject integral attachment weld is impractical.

The figures[4] provided by the licensee demonstrate that clevis plate attachment weld H002-1 is fully covered by permanent, clam-shell enclosure pipes that have been circumferentially welded to the carbon steel piping pressure boundary. The licensee obtained 100% surface coverage of these circumferential welds attaching the encapsulation segments to the pressure boundary outside surface, but was unable to examine any of the clevis plate attachment welds from the outside of the clam-shell support. No relevant flaws were detected during the examinations of the circumferential welds. In addition, other clevis attachment weld configurations were examined during this inspection interval, and no relevant indications have been observed. Based on the coverages obtained, if significant patterns of service-induced degradation were present in the subject integral attachments, there is reasonable assurance that evidence of it would have been detected by the examinations performed.

Therefore, considering the impracticality of performing the ASME Code-required 100% surface examinations, and the examination coverage obtained on the subject integrally welded attachment, it is recommended that relief be granted for the third interval at Surry 1, pursuant to 10 CFR 50.55a(g)(6)(i).

3.3 Request for Relief PRT-04, Examination Category R-A, Full Penetration Piping Welds Governed by the Risk-Informed Program

ASME Code Requirement: The examination requirements for Class 1, 2 and 3 piping welds at Surry 1 are governed by a Risk-Informed Inservice Inspection (RI-ISI) program that was approved by the NRC in an SER dated December 16, 1998. The RI-ISI program was developed in accordance with WCAP-14572, Rev. 1-NP-A, *Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report* (WCAP). As part of the NRC-approved program, the licensee has implemented inspection requirements listed in ASME Code Case N-577, *Risk-Informed Requirements for Class 1, 2 and 3 Piping, Method A*, with more detailed provisions contained in the WCAP. Table 1 of Code Case N-577 assigns the Examination

4. Figures depicting the design and limited access for the subject welds are not included in this report.

Category R-A, Item R1.11, to piping inspection elements subject to thermal fatigue, and requires 100% of the examination location volume, as described in Figures IWB-2500-7, 8, 9, 10, or 11, as applicable, for Class 1 circumferential piping welds.

Licensee's Proposed Alternative: In accordance with 10CFR50.55a(a)(3)(i), the licensee has proposed an alternative to the volumetric examination coverage requirements contained in Table 1 of ASME Code Case N-577 for Safety Injection System (SIS) piping Welds 1-05 and 1-11 at Surry 1. The alternative is to perform examinations on limited portions of each of these welds, in lieu of 100% of the required volume for one of the welds, as is required by the RI-ISI program.

Licensee's Basis for Alternative (as stated):

Weld 1-05 is a circumferential weld joining a valve and a pipe tee. The material type and outside profile do not allow for ultrasonic examination from the outside, resulting in no coverage of the examination volume in the 2 direction. Only 14% of the examination volume could be attained in the 2 and 5 direction. For flaws oriented transverse to the welds, in the 7 and 8 scan direction, full coverage was attained. The total average percent coverage obtained was 57%. (See Table 3.3.)

Ultrasonic shear wave examination was attempted on the tee and valve sides of the weld and it was apparent that the material for these components is cast stainless steel. At elevated sensitivity levels, an inner diameter roll was not visible on the valve side and excessive noise resulted on the tee side. The weld material was examined to the maximum extent practical in the 2, 5, 7, and 8 directions. Alternative ultrasonic techniques would not produce additional meaningful data.

Weld 1-11 is a circumferential weld joining a pipe tee and a reducer. The material type and outside profile do not allow for ultrasonic examination from the tee side in the 2 direction resulting in no coverage of the examination volume. From the reducer side, due to curved surface configuration and the weld profile, only 44% of the examination volume could be examined in the 5 direction. For the flaws oriented transverse to the welds, i.e., the 7 and 8 directions, full coverage was achieved. The total average percent coverage obtained is 61%. (see Table 3.3 below.)

Due to material type limitations of the tee (cast stainless) and the component outer diameter contour of the reducer, the examination volume was examined to the maximum extent practicable. Alternative ultrasonic techniques would not produce additional meaningful data.

Table 3.3 - % UT Scan Coverage at 45 degree Angle Beam

Weld	Scan Direction and Coverage				Total Average
	2	5	7	8	
1-05	14%	14%	100%	100%	57%
1-11	0%	44%	100%	100%	61%

UT Scan Direction Definitions
2- Axial [Angle Beam] Scan, 180 degrees from isometric flow direction.
5- Axial [Angle Beam] Scan, The same direction as the isometric flow.
7- Circumferential [Angle Beam] Scan, clockwise rotation when viewing in the direction of isometric flow.
8- Circumferential [Angle Beam] Scan, counter clockwise rotation when viewing in the direction of isometric flow.

The examinations performed and the considerations discussed above adequately address the postulated concerns associated with the RI-ISI program and the partial examinations. Dominion requests relief in accordance with 10 CFR 50.55a(a)(3)(i) for the supplemental examinations discussed above to be considered as an acceptable alternative for completion of this RI-ISI ultrasonic examination requirement.

The RI-ISI program is a "Living program." The limitations experienced with the ultrasonic examination will be discussed with the panel at the next update meeting and will be given additional consideration with regard to some of the conservative classifications discussed above.

Licensee's Response to Request for Additional Information (as stated):

Since the examination coverage that was attained on welds 1-05 and 1-11 would not necessarily, by itself, detect the postulated mechanism if present, alternative means were used to determine whether the damage mechanism was present.

The postulated damage mechanism for segment ECC-002 was thermal fatigue caused by thermal cycling. The mechanism is caused by leakage past the charging system isolation valve sending colder water into the reactor coolant system. The postulated damage mechanism is potentially more prevalent in the reactor coolant system at segment RC-042 downstream of segment ECC-002. The Surry Risk-Informed Inservice Inspection (RI-SI) Expert Panel was concerned that the check valve (1-SI-82) separating the two segments might not seat correctly causing segment ECC-002 to be subject to the postulated damage mechanism also. Quantitatively, segment ECC-002 was low safety significant (LSS); however, the Expert Panel made the segment high safety significant (HSS) due to the check valve concern.

WCAP-14572 recommends the selection of an additional weld if a partial examination is obtained. In the case of weld 1-05 on segment ECC-002, the weld was classified "1(a)" or mandatory. Weld 1-08 was also selected on segment ECC-002 as a "1(b)" or sample selection. Full volumetric coverage was attained on weld 1-08. Since only partial coverage was attained on weld 1-05, weld 1-11 was selected to supplement the 1-05 examination. Weld 1-11 is just upstream of weld 1-05 on segment ECC-022. Only slightly better coverage was attained on weld 1-11 as compared to weld 1-05.

A review of examinations for the third interval indicated that weld 1-07, which is also on segment ECC-002, had been volumetrically examined with full coverage prior to implementation of the RI-SI program. Neither of the full volumetric coverage welds 1-07 or 1-08 indicated any problems within the segment. Additional, surface exams were performed on the locations with no problems noted.

Segment RC-042 (downstream from ECC-002) was also examined for the postulated damage mechanism at two locations volumetrically in the third interval. As explained above, this segment is the location for which the postulated damage mechanism is potentially more prevalent. Volumetric coverage requirements were met at each location with no problems identified.

It was concluded from all the examinations performed that the postulated damage mechanism was not present. As such, no further examinations were deemed required, and a partial relief request was submitted for welds 1-05 and 1-11.

Subsequently, the RI-SI Expert Panel determined that the check valve concern for segment ECC-002 no longer existed due to actions that were taken to ensure positive valve (1-SI-82) closure. As part of the periodic update, segment ECC-002 was returned to a LSS classification and no longer requires examination thus confirming our initial quantitative assessment that the damage mechanism was not present.

Evaluation: The examination requirements for the subject piping welds at Surry 1 are governed by a Risk-Informed Inservice Inspection (RI-ISI) program that was approved by the NRC in an SER dated December 16, 1998. This program assigns Examination Category R-A, Item R1.11, to piping inspection elements subject to thermal fatigue, and requires inspection of 100% of the examination location volume, as described in Figures IWB-2500-7, 8, 9, 10, or 11, as applicable, for Class 1 circumferential piping welds. However, the subject piping weld configurations and base materials severely limit volumetric examinations. In order to meet the RI-ISI program volumetric coverage requirements, these components would have to be re-designed and modified. Therefore, 100% volumetric examination is not considered to be completely examinable for the subject piping welds.

Piping segment ECC-002 (as designated by the RI-ISI program) is an intersecting conduit of piping between the low and high pressure safety injection lines. The Surry 1 RI-ISI program only required that certain welds in segment ECC-002 be examined to detect the presence of thermal fatigue, should this potential degradation mechanism occur. Segment ECC-002 is actually a portion of piping evaluated to be of low safety significance, but because this segment is only separated from a high safety significant segment by a single check valve, the Surry 1 expert panel added Weld 1-05 to the inspection sample to ensure that, should this check valve leak-by, and subject ECC-002 to thermal stratification of fluids, fatigue cracks could be detected if manifested.

Weld 1-05 is a valve-to-tee configuration with outside surface transitions and curvatures that do not allow ultrasonic sound beams to be projected into the full area of interest. In addition, the base materials for both the valve and tee are cast stainless steel, which severely attenuates acoustic energy. However, the licensee obtained full coverage for flaws that might be oriented transverse to the weld, with approximately 57% overall volumetric coverage. To supplement the volumetric coverage on Weld 1-05, the licensee elected to perform an additional examination on Weld 1-11, a pipe tee-to-reducer design that also contains outside surface conditions that limit ultrasonic scanning. Approximately 61% of the required volumetric coverage was obtained on this weld. The licensee's proposed alternative is to use the combined limited coverages for both Welds 1-05 and 1-11 in lieu of obtaining 100% volumetric coverage for Weld 1-05.

Descriptions of the materials and geometry provided by the licensee have shown that full volumetric coverage is not possible for Welds 1-05 and 1-11 on this Surry 1 safety injection system piping. The licensee's RI-ISI program initially scheduled Weld 1-05 for examination in this low safety significant line segment, as a conservative approach to ensure that, if the check valve disc did not seat properly and allowed high temperature water to infrequently mix with normally cooler water in this line segment, thermally stratified fluids could develop, and may cause thermal fatigue to occur. Because 100% of the required examination volume could not be obtained, the licensee elected to examine adjacent Weld 1-11, which also presented ultrasonic scan restrictions due to its geometry. Further, the licensee reported that Weld 1-08, a pipe-to-pipe configuration on this line segment, was examined as part of the RI-ISI supplemental sampling with no limitations noted. None of these examinations detected any thermal fatigue damage in this line segment.

Based on the licensee's approach to conservatively perform an additional examination, along with the supplemental examination performed on Weld 1-08, it is concluded that if significant patterns of thermal fatigue, or other service-induced degradation were present in the subject piping segment, there is reasonable assurance that evidence of it would have been detected by the examinations performed. The licensee's approach to use the limited examination results for two welds, in lieu of full volumetric examination on a single weld, provides an acceptable level of quality and safety, therefore it is recommended that, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's alternative be authorized for the third interval at Surry 1.

3.4 Request for Relief PRT-05, Revision 1, Examination Category B-B, Pressure Retaining Welds in Vessels Other Than Reactor Vessels

ASME Code Requirement: Examination Category B-B, Item B2.11, requires volumetric examination, as described in Figure IWB-2500-1, of "essentially 100%" of the length of circumferential shell-to-head welds on the pressurizer (PZR). In addition, Item B2.12 requires volumetric examination of one foot of longitudinal welds that intersect the selected circumferential shell-to-head welds. "Essentially 100%," as clarified by ASME Code Case N-460, is greater than 90% coverage of the examination volume, or surface area, as applicable.

Licensee's ASME Code Relief Request: In accordance with 10CFR50.55a(g)(5)(iii), the licensee requested relief from the ASME Code volumetric examination coverage requirements for full penetration vessel Welds 1-07 and 1-15 on the Surry 1 PZR.

Basis for Requesting Relief (as stated):

The pressurizer is covered with an insulation support ring. The insulation support ring is 6-inches wide at the location where examination interference is encountered for Weld 1-07. As seen in Figure 1[5], this insulation support ring and a power operated relief valve support prevent complete volumetric coverage of both the upper circumferential head weld and the intersecting longitudinal Weld 1-15. Total removal of the insulation support

5. The drawing supplied by the licensee is not included in this report.

ring at the mechanical connection is considered impractical due to high anticipated exposure levels, estimated at 18 man-rem. Partial removal of the support ring could allow some increased coverage; however, the actual increase would be very small in relation to the entire weld length. This partial removal is not a viable alternative when considering consequential disturbance of interconnected cross supports and the welded connections to safety and power operation relief valve supports. Any removal of the mechanical connections or forced spreading apart of components would create a risk of misalignment and possible warping of the structure.

Weld 1-07, the circumferential head weld, was examined for 100% of the weld length. Examination coverage of the required examination volume was limited due to the position of hardware that supports the safety valves. Table 3.4-1 shows the percent volume that was examined by each scan direction. All areas were examined to the maximum extent practical for flaws oriented in the circumferential and axial directions. The average total examination coverage of all scan directions is 46.3%. These percentages are based on total volume of the weld per scan.

Figure 2[6] show obstructions for weld 1-07 in the 2 and 5 directions using both 45 and 60 degree angle beams. The 2 direction was limited as shown by the safety valve support ring for the entire length of the weld. The 2" X 2" welded pad (typical of three) reduced the weld inspection as shown of 2% of the total weld length in the 2 direction. Also, the instrument nozzle (typical of four) limited the 2 direction for 0.7% of the total weld length as shown for 45 and 60 degree angle beams. The 5 direction scan was limited by the safety valve support ring for the entire length of the weld. Total percentage covered is determined by calculating the cross sectional area not examined, multiplying by the percent limitation of the entire weld length attributed to that obstruction and subtracting from 100% coverage.

Examination of weld 1-15 was examined to the maximum extent possible but was limited by the power operated valve support. Table 3.4-2 shows the percent volume achieved for each scan direction. All areas were examined to the maximum extent practical for flaws oriented in the circumferential and axial directions. The average total examination coverage of all scan directions is 30.5%, based on total volume of weld per scan.

Table 3.4-1 Weld 1-07, % Volume by Scan Direction

SCAN ANGLE, degrees	SCAN DIRECTION	SCAN AREA	% EXAMINED
0	0	Weld and Base Metal	68
45	2	Weld and Base Metal	82
60	2	Weld and Base Metal	92
45	5	Weld and Base Metal	15
60	5	Weld and Base Metal	20
45	7	Weld and Base Metal	35
60	7	Weld and Base Metal	35
45	8	Weld and Base Metal	35

6. The figures submitted by the licensee are not included in this report.

Table 3.4-1 Weld 1-07, % Volume by Scan Direction			
SCAN ANGLE, degrees	**SCAN DIRECTION**	**SCAN AREA**	**% EXAMINED**
60	8	Weld and Base Metal	35
Average Percent Examined for Weld 1-07: 46.3%			

Table 3.4-2 Weld 1-15, % Volume by Scan Direction			
SCAN ANGLE, degrees	**SCAN DIRECTION**	**SCAN AREA**	**% EXAMINED**
0	0	Weld and Base Metal	10
45	2	Weld and Base Metal	57
60	2	Weld and Base Metal	75
45	5	Weld and Base Metal	36
60	5	Weld and Base Metal	57
45	7	Weld and Base Metal	10
60	7	Weld and Base Metal	10
45	8	Weld and Base Metal	10
60	8	Weld and Base Metal	10
Average Percent Examined for Weld 1-15: 30.5%			

UT Scan Direction Definitions for [Tables 3.4-1 and 3.4-2]

[0 - longitudinal straight beam oriented perpendicular to outside surface.]
2 - axial [angle beam] scan, 180 degrees from isometric flow direction.
5 - axial [angle beam] scan, the same direction as the isometric flow.
7 - circumferential [angle beam] scan, clockwise rotation when viewing in the direction of isometric flow.
8 - circumferential [angle beam] scan, counter-clockwise rotation when viewing in the direction of isometric flow.

Figure 4[6] shows the general configuration of obstruction for weld 1-15. Figure 5[6] gives greater detail for the particular scans for the 2 and 5 directions using 45 and 60 degree angle beams. The hatched areas indicate zero coverage due to the safety valve support. The percentage covered for the entire weld length is given for each scan direction on Figure 5[6] and was calculated by determining the cross sectional area not examined, multiplying by the percent limitation for the required weld length and subtracting from 100% coverage.

Licensee's Proposed Alternative Examination (as stated):

No additional ultrasonic examination techniques, such as extended beam or alternative nondestructive examination methods would provide meaningful additional data on this cladded material for the examination volume not attained. It is proposed that the percentage coverage obtained by considered as meeting the Code requirements in accordance with 10 CFR 50.55a(a)(3)(ii) since any effort to achieve greater coverage is considered a hardship due to the risk of component damage and excessive personnel dose exposure without a compensating level of quality and safety.

Evaluation: The ASME Code requires 100% volumetric examination of the length of full-penetration shell and head welds, and one-foot of intersecting longitudinal welds, for Class 1 pressure vessels to be performed during each inspection interval. For PZR shell-to-head Weld 1-07, and longitudinal shell Weld 1-15, full volumetric examinations cannot be performed due to scan restrictions caused by component support columns and lugs, instrument nozzles and a vessel insulation support ring. In order to meet the ASME Code requirements, these support and instrumentation appurtenances would have to be disassembled and removed. Disassembly of the insulation and support structure would place a considerable burden on the licensee.

As shown on the drawings[7] provided by Dominion, the insulation support structure, specifically the main support ring, restricts access to circumferential shell-to-head Weld 1-07. Ultrasonic scans performed from the shell side are severely limited due to the interference caused by this ring. Other small welded pads and instrument tubes are intermittently spaced around the circumference of the PZR which also limit scanning from the head side of Weld 1-07. Access to intersecting longitudinal Weld 1-15 is restricted by a vertical box column that forms part of the power-operated relief valve (PORV) structure, and is also impacted by the insulation support ring. The insulation support structure and the PORV, and it's supports, could be disassembled for greater access to examine these welds. However, the licensee estimates radiation exposure to workers would be approximately 18 man-rem to accomplish these tasks. Thus, requiring the licensee to disassemble these structures would impose a significant hardship.

The licensee was able to obtain greater than 80% of the ASME-required examination volume for circumferential shell-to-head Weld 1-07 from the head side, and approximately 60% of the required volume from each side of intersecting longitudinal Weld 1-15. These examinations were performed with 45 and 60-degree shear wave methods. The PZR shell is fabricated of carbon steel with stainless cladding on the inside diameter surface, and during previous round robin tests, as reported in NUREG/CR-5068, it has been demonstrated that ultrasonic examinations of ferritic material from a single side provide high probabilities of detection (usually 90% or greater) for both near- and far-side cracks in blind inspection trials. Based on the level of examination coverage obtained, it is concluded that if significant patterns of service-induced degradation were present in the subject PZR welds, there is reasonable assurance that evidence of it would have been detected by the examinations performed.

The licensee has proposed that the examinations completed be considered to meet the ASME Code-requirements for the subject PZR welds. Considering the access limitations and the coverage obtained, to require the licensee to dissemble the insulation and PORV support structures in order to obtain gain further volumetric examination coverage would impose an undue hardship with no compensating increase in quality or safety. Therefore, pursuant to 10 CFR 50.55a(a)(3(ii), it is recommended that the licensee's proposed alternative be authorized for the third interval at Surry 1.

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7. Drawings supplied by the licensee are not included in this report.

3.5 Request for Relief PRT-06, Examination Category C-A, Pressure Retaining Welds in Pressure Vessels

ASME Code Requirement: Examination Category C-A, Item C1.20 requires "essentially 100%" volumetric examination, as described in Figure IWB-2500-1, of the length of circumferential head-to-shell welds in Class 2 vessels. "Essentially 100%," as clarified by ASME Code Case N-460, is greater than 90% coverage of the examination volume, or surface area, as applicable. The ASME Code allows distribution of the volumetric examination among several vessels, in case of multiple similar components.

Licensee's ASME Code Relief Request: In accordance with 10CFR50.55a(g)(5)(iii), the licensee requested relief from the ASME Code volumetric examination coverage requirements for Residual Heat Removal (RHR) heat exchanger shell-to-head Weld 1-A01.

Basis for Requesting Relief (as stated):

This Code requirement for the Residual Heat Removal (RHR) heat exchanger circumferential head weld was divided into thirds of the 360 degree circumference and distributed between "A" and "B" heat exchangers as in the previous interval. Fifty-eight percent (58%) coverage of the 0" datum point to 44" on "A" was obtained. One hundred percent (100%) coverage of 44" to 88" was obtained on "B" heat exchanger and 91% of the 88" datum to 0" on "A" was covered. Thus, the total percent coverage for the circumference of the RHR heat exchanger head weld is 83%.

The limitation in examination was created by the concrete support and inlet nozzle shown on page 3. The figures[8] on page 4 show the exact location of interference for weld 1-01 on the "A" heat exchanger. A 45-degree angle beam was used, and partial percentages per scan are shown in the following table.

Table 3.5 - % UT Scan Coverage at 45 degree Angle Beam

Vessel	Weld Area	2	5	7	8
A	0" to 44"	34%	48%	58%	58%
B	44" to 88"	100%	100%	100%	100%
A	88" to 0"	91%	91%	91%	91%

UT Scan Direction Definitions [for Table Above]

2 - axial scan, 180 degrees from isometric flow direction.
5 - axial scan, the same direction as the isometric flow.
7 - circumferential scan, clockwise rotation when viewing in the direction of isometric flow.
8 - circumferential scan, counter-clockwise rotation when viewing in the direction of isometric flow.

8. Figures and sketches supplied by the licensee are not included in this report.

An extended beam path 1.5 MHz at a 45-degree angle was used to achieve the maximum possible coverage. Additional scans using different angles, additional beam paths or alternative techniques will not improve quality or quantity of examination. No recordable indications were noted on any of the areas examined. The portions of the weld not examined are virtually inaccessible, and it would be impractical to attempt to remove any portion of the concrete support to allow full examination.

Licensee's Proposed Alternative Examination (as stated):

Dominion proposes that the examinations already completed at the reduced coverage of 83% for this Category C-A, Item C1.20 weld are acceptable for meeting the Code requirements in accordance with 10 CFR 50.55a(g)(6)(i). The Code requirement in this application is impractical because of the concrete support and connecting pipe interference making the particular weld areas inaccessible. Any through-wall leakage on this component would likely be detected during the periodic VT-2 exam that is performed on this component under Category C-H.

Similar relief was previously granted by the NRC in letter dated April 14, 1994 for the previous interval.

Evaluation: The ASME Code requires 100% volumetric examination of the length of Class 2 vessel shell-to-head welds be performed once each 10-year inspection interval. In the case of multiple vessels of similar design and function, the examinations may be distributed among the vessels. However, for the RHR heat exchangers at Surry 1, component support structures, and the inlet nozzles' design, limit access to perform the ASME Code-required volumetric examinations. In order to meet the ASME Code requirements, the support and nozzle would have to be re-designed and modified. Therefore, 100% volumetric examination is impractical for head-to-shell Weld 1-A01 on RHR heat exchanger A.

The RHR heat exchangers at Surry 1 are tube-in-shell type that contain circumferential welds connecting the domed head with the cylindrical shell. The figures[9] provided by the licensee show that concrete pads and steel gusset plates forming the primary support for these components, and the blend radius on the inlet nozzles, restrict access for scanning a portion of Weld 1-A01 from both the head and shell sides, making 100% volumetric examination of this portion of the weld length impractical. The licensee, as allowed by ASME Code, has elected to distribute the examination of the head-to-shell weld on RHR heat exchangers A and B. This means that the equivalent length of one head-to-shell weld is scheduled to be completed by examining portions of each of the subject welds on heat exchangers A and B, i.e., two-thirds of this weld is examined on heat exchanger A and one-third on heat exchanger B.

The licensee was able to obtain a substantial aggregate coverage (approximately 81%) of the ASME Code-required volume in this manner by examining 100% of the heat exchanger B segment, and 50% and 91%, respectively, of heat exchanger A segments. No recordable indications were noted on any of the completed weld volumes. Based on

9. The figures depicting component support and inlet nozzle interferences are not included in this report.

the volumetric coverages obtained, it is concluded that if significant patterns of service-induced degradation were present in the subject RHR heat exchanger head-to-shell welds, there is reasonable assurance that evidence of it would have been detected by the examinations performed.

Therefore, considering the impracticality of performing the ASME Code-required 100% volumetric examinations, and the examination coverages obtained, it is recommended that relief be granted for the third interval at Surry 1, pursuant to 10 CFR 50.55a(g)(6)(i).

4.0 CONCLUSIONS

The PNNL staff has reviewed the licensee's submittal and concludes that ASME Code examination coverage requirements are impractical for the subject welds listed in Requests for Relief PRT-02, -03, and -06. Further, if significant service-induced degradation were occurring in the subject components, there is reasonable assurance that evidence if it would have been detected by the examinations that were performed. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), it is recommended that these requests be granted for the third 10-year interval at Surry Power Station, Unit 1, which concluded on October 13, 2003.

For Request for Relief PRT-04, the licensee’s proposed alternative provides an acceptable level of quality and safety, therefore, it is recommended that this request be authorized for the third interval, pursuant to 10 CFR 50.55a(a)(3)(i).

Further, for Request for Relief PRT-05, Revision 1, it has been shown that subjecting the licensee to remove support appurtenances in order to meet ASME Code requirements for 100% volumetric coverage of the subject PZR shell and head welds would present a hardship with no compensating increase in quality or safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that the proposed alternative be authorized for the third interval at Surry 1.

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

SURRY POWER STATION, UNIT 1
Third 10-Year ISI Interval

TABLE 1
SUMMARY OF RELIEF REQUESTS

Relief Request Number	PNNL TLR RR Sec.	System or Component	Exam. Category	Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Disposition
PRT-02	3.1	Integral Attachment Welds	C-C	C3.20	100% of integral attachment welds to piping	Surface	Use achieved surface coverage	Granted 10CFR50.55a(g)(6)(i)
PRT-03	3.2	Integral Attachment Welds	C-C	C3.20	100% of integral attachment welds to piping	Surface	Use achieved surface coverage	Granted 10CFR50.55a(g)(6)(i)
PRT-04	3.3	Piping Welds	R-A	R1.11	100% of pressure retaining welds selected as part of the RI-ISI program	Volumetric	Use achieved volumetric coverage	Authorized 10CFR50.55a(a)(3)(i)
PRT-05, Rev. 1	3.4	PZR Shell and Head Welds	B-B	B2.11 B2.12	100% of pressure retaining circumferential shell-to-head welds, and one foot of connecting longitudinal seams	Volumetric	Use achieved volumetric coverage	Authorized 10CFR50.55a(a)(3)(ii)
PRT-06	3.5	RHR Heat Exchanger	C-A	C1.20	100% of the length of shell-to-head welds	Volumetric	Use achieved volumetric coverage	Granted 10CFR50.55a(g)(6)(i)

Surry Power Station, Units 1 & 2

cc:
Ms. Lillian M. Cuoco, Esq.
Senior Counsel
Dominion Resources Services, Inc.
Building 475, 5th Floor
Rope Ferry Road
Waterford, Connecticut 06385

Mr. Donald E. Jernigan
Site Vice President
Surry Power Station
Virginia Electric and Power Company
5570 Hog Island Road
Surry, Virginia 23883-0315

Senior Resident Inspector
Surry Power Station
U. S. Nuclear Regulatory Commission
5850 Hog Island Road
Surry, Virginia 23883

Chairman
Board of Supervisors of Surry County
Surry County Courthouse
Surry, Virginia 23683

Office of the Attorney General
Commonwealth of Virginia
900 East Main Street
Richmond, Virginia 23219

Mr. Chris L. Funderburk, Director
Nuclear Licensing & Operations Support
Dominion Resources Services, Inc.
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, Virginia 23060-6711

Dr. W. T. Lough
Virginia State Corporation Commission
Division of Energy Regulation
Post Office Box 1197
Richmond, Virginia 23218

Dr. Robert B. Stroube, MD, MPH
State Health Commissioner
Office of the Commissioner
Virginia Department of Health
Post Office Box 2448
Richmond, Virginia 23218