

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

December 5, 2003

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

Serial No. 02-642A  
NL&OS/GDM R1  
Docket No. 50-280  
License No. DPR-32

**VIRGINIA ELECTRIC AND POWER COMPANY**  
**SURRY POWER STATION UNIT 1**  
**FOURTH INTERVAL INSERVICE INSPECTION PROGRAM**  
**REQUEST FOR ADDITIONAL INFORMATION**

In a letter dated December 12, 2002 (Serial No. 02-642) Virginia Electric and Power Company (Dominion) submitted the inservice inspection (ISI) program for the fourth inservice inspection interval for Surry Unit 1 for Class 1, 2, and 3 components and component supports. During the course of their review, the NRC staff identified the need for additional information to facilitate the completion of their review. On August 26, 2003, the NRC Project Manager provided the staff's questions associated with the overall ISI fourth interval program submittal and the relief requests included therein. These questions and our proposed responses were discussed during a conference call held on September 15, 2003. At the conclusion of the conference call, we agreed to provide a written response to the NRC's questions. Accordingly, Dominion's response to the staff's questions is provided in the attachment.

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

Very truly yours,



Leslie N. Hartz  
Vice President – Nuclear Engineering

Attachment

Commitments made in this letter: None

A047

cc: U.S. Nuclear Regulatory Commission  
Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth St., SW, Suite 23T85  
Atlanta, Georgia 30303-8931

Mr. G. McCoy  
NRC Senior Resident Inspector  
Surry Power Station

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

Mr. Chris Gratton  
USNRC - One White Flint North  
11555 Rockville Pike  
Mail Stop 8-G9  
Rockville, MD 20852

**REQUEST FOR ADDITIONAL INFORMATION**  
**FOURTH INTERVAL INSERVICE INSPECTION PROGRAM**  
**VIRGINIA ELECTRIC POWER COMPANY**  
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**DOCKET NUMBER 50-280**

CMP-001

*The licensee states that any ultrasonic examination of the pressurizer surge nozzle could only be described as "best effort". The licensee also states that remote visual technology has very little if any reasonable probability of success. The licensee made similar statements when requesting the same relief on the pressurizer surge nozzle for the third 10-year ISI interval. Given that ultrasonic testing examination techniques and technology as well as remote visual technology has improved greatly in the last 10 years, please explain what steps have been taken by the licensee in the past 10 years to try to improve the level of inspection on the pressurizer surge nozzle. The staff also requests detailed drawings that show cross sectional view of the surge nozzle, thermal sleeve, basket diffuser and material specification, as well as drawings that clearly show interference on the outside of the vessel. The drawings should include dimensions.*

Response

We request that Relief Request CMP-001 be withdrawn at this time with the intent of resubmitting a revised relief request in the near future after completion of further research.

CMP-002

*The licensee states that "A remote visual examination (VT-1) of the inside diameter of the pump casing welds will be performed only if the pump is disassembled for maintenance." Please state if any of the pumps listed in relief request CMP-002 have been disassembled since original installation. The licensee states that some welds are partially accessible. Please provide a list of partially-accessible welds and indicate what percentage of the welds in the pump casing can be inspected in accordance with the American Society of Mechanical Engineers (ASME) Code requirements.*

Response

Both of the recirculation spray pumps have been previously pulled for maintenance. Recirculation Spray (RS) Pump 1-RS-P-2A was pulled for maintenance in 1988, and RS pump 1-RS-P-2B was pulled for maintenance in 1987. Safety Injection (SI) pump 1-SI-P-1A was pulled for maintenance in 1989. The records reviewed indicated all visual inspections were satisfactory. Additional partial relief requests will be submitted to meet the Category C-G code requirement for these pumps when the pump casing welds

above ground are examined and exact percentages of obtained coverage is known. These reliefs will be similar to Relief Requests SR-021 and SR-022 previously approved by the NRC in a letter dated August 21, 2001

### CMP-003

*The licensee states that ultrasonic test (UT) calibration blocks were generally in compliance with the requirements of the applicable ASME Code; however, the licensee also identifies several examples where the UT calibration blocks are not in compliance. Please provide a detailed list of all features of the currently used UT calibration blocks that are not in compliance with ASME Code. In the licensee's submittal, the licensee gives examples of components that will be inspected with the aforementioned calibration blocks. Please identify all affected components including materials and thicknesses. Please indicate if any of the UT calibration blocks referenced in CMP-003 have been used in an ASME Code, Section XI, Appendix VIII qualified procedure.*

### Response

This relief request is being withdrawn based on the NRC's previous response to a similar relief request for North Anna Unit 2. In their Safety Evaluation included in a letter dated June 12, 2002 for the North Anna Unit 2 relief request, the NRC stated that: "the ASME Code already provides a means of considering the use of alternative calibration blocks under the provisions of IWA-2240. Thus, the licensee's implementation of IWA-2240 regarding the application of alternative calibration blocks obviate the need for this relief request."

### CMP-004

- 1. What specific paragraphs of IWA-2600 do you request relief from?*
- 2. What is the specific relief that is requested?*
- 3. What is the original Code of Construction? Please provide the Code, Edition and Addenda.*
- 4. Describe the hardship or unusual difficulty that the Code requirements would impose*

### Response

We request that Relief Request CMP-004 be withdrawn at this time with the intent of submitting a revised relief request at a later date.

### CMP-005

- 1. What specific paragraphs of IWA-2600 do you request relief from?*
- 2. What is the specific relief that is requested?*

3. *What is the original Code of Construction? Please provide the Code, Edition and Addenda.*
4. *Paragraph III., on page 2-13 of the relief request references 10 CFR 50.55a(a)(3(ii) for this relief request. Describe the hardship or unusual difficulty that the Code requirements would impose.*
5. *State the code class of the welds to be examined with this relief request.*

Response

We request that Relief Request CMP-005 be withdrawn at this time with the intent of submitting a revised relief request at a later date.

CC-001

*In a final rule dated July 8, 2003 (68 FR40469), the NRC revised 10 CFR 50.55a to incorporate by reference, Regulatory Guide 1.147, Revision 13. Code Case N-532-1 has been conditionally accepted in Regulatory Guide (RG) 1.147, Revision 13. Please review Code Case N-532-1 with the conditions identified in RG 1.147, Rev. 13, and determine if relief is still needed.*

Response

We request that Relief Request CC-001 be withdrawn. Dominion will follow approved Code Case N-532-1 with the conditions identified in RG 1.147 Rev. 13.

CC-002

*In a final rule dated July 8, 2003 (68 FR40469), the NRC revised 10 CFR 50.55a to incorporate by reference, Regulatory Guide 1.147, Revision 13. Code Case N-533-1 has been conditionally accepted in Regulatory Guide (RG) 1.147, Revision 13. Please review Code Case N-533-1 with the conditions identified in RG 1.147, Rev. 13, and determine if relief is still needed.*

Response

We request that Relief Request CC-002 be withdrawn. Dominion will follow approved Code Case N-533-1 with the conditions identified in RG 1.147 Rev. 13.

CC-003

*In a final rule dated July 8, 2003 (68 FR40469), the NRC revised 10 CFR 50.55a to incorporate by reference, Regulatory Guide 1.147, Revision 13. Code Case N-566-1*

*has been accepted in Regulatory Guide (RG) 1.147, Revision 13. Effective August 7, 2003, relief is not required to use Code Case N-566-1.*

Response

We request that Relief Request CC-003 be withdrawn. Dominion will follow approved Code Case N-566-1.

CC-004

*In a final rule dated July 8, 2003 (68 FR40469), the NRC revised 10 CFR 50.55a to incorporate by reference, Regulatory Guide 1.147, Revision 13. Code Case N-597-1 has been conditionally accepted in Regulatory Guide (RG), 1.147 Revision 13. Please review Code Case N-597-1 with the conditions identified in RG 1.147 Rev. 13, and determine if relief is still needed.*

Response

We request that Relief Request CC-004 be withdrawn. Dominion will follow approved Code Case N-597-1 with the conditions identified in RG 1.147, Revision 13.

CC-005

*In a final rule dated July 8, 2003 (68 FR40469), the NRC revised 10 CFR 50.55a to incorporate by reference, Regulatory Guide 1.147, Revision 13. Code Case N-623 has been accepted in Regulatory Guide (RG) 1.147, Revision 13. Effective August 7, 2003, relief is not required to use Code Case N-623.*

Response

We request that Relief Request CC-005 be withdrawn. Dominion will follow approved Code Case N-623.

R-001

*Please provide more detail on the request to include branch connection welds. Does the licensee seek relief from the socket weld side only of branch connections? Explain what other weld joint designs are included in the effected branch connections. Has the licensee considered performing a surface examination on High Safety Significant (HSS) socket welds and branch connections? Please justify your decision to perform a VT-2 examination and not surface examination. Explain how a VT-2 examination provides assurance of structural integrity. Please indicate if examinations will be performed with insulation removed.*

*For the R-001 relief request, provide a list of all High Safety Significant branch connections for which relief is requested and include their weld joint designs (dimensions). For the branch connection weld joint designs that contain full penetration welds, please explain why an Ultrasonic Testing examination cannot be performed. Please discuss any industry initiatives to develop more efficient ways of inspecting socket welds.*

## Response

Dominion previously submitted letters dated June 13, 2002; April 2, 2003; and June 5, 2003, associated with Relief Request R-001 for Surry and North Anna Power Station Units 1 and 2. The NRC issued a safety evaluation approving Relief Request R-001 for all four units in a letter dated September 23, 2003. These letters addressed previous NRC questions on R-001 and should appropriately address the NRC questions associated with the identical R-001 relief requested for the fourth interval ISI Program.

The Surry Unit 1 RI-ISI Expert Panel meeting is currently scheduled for the first quarter of 2004 to address final selections for the fourth ISI interval. As such, a specific listing is not yet available, but can be supplied at a later date, if still required. The list would be subject to change over the ten-year interval as part of the "living program" process. Relief Request R-001 addresses both the socket side and the main pipe run side of the branch connection in anticipation that these locations will be selected by the Expert Panel over the duration of the interval. Branch connections at Surry can either be the full penetration weld type or the weld-o-let (partial penetration) type design.

The relief request addresses damage mechanisms that require a volumetric examination per WCAP 14572 Rev.1-NP-A and ASME Code Case N-577 (approved for use for the Surry Unit 1 RI-ISI pilot program). Damage mechanisms associated with the external piping surface which require a surface examination are unaffected by this request. Surface examinations would be performed in that situation. The relief addresses volumetric examinations on small diameter (2 NPS and less) branch connections and socket welds where either the design or geometry precludes any meaningful ultrasonic examination results. The damage mechanism associated with these welds are inner diameter (ID) originating; therefore, a surface examination would be of little benefit. A more frequent (each refueling outage) visual (VT-2) examination is the next best alternative examination to be performed and is the current ASME guidance for this situation. The VT-2 examination will be performed at pressure and in accordance with the insulation requirements identified in 10 CFR 50.55a(b)(2)(xx) as follows:

### Class 1 HSS

Insulated components – 4 hours minimum at test pressure  
Non-insulated components – 10 minutes at test pressure

### Class 2 or 3 HSS

Normally operating

Insulated components – system operating at least 4 hours

Non-insulated components – system operating for at least 10 minutes

Normally standby (not operating)

Insulated and non-insulated – 10 minutes minimum at test pressure

Dominion is aware of industry efforts to address certain damage mechanisms with alternative volumetric examination techniques that will in some instances include small diameter branch and socket welds. As these become available, Dominion will address these situations for incorporation, if applicable.

SPT-002

*In a final rule dated July 8, 2003 (68 FR40469), the NRC revised 10 CFR 50.55a to incorporate by reference, Regulatory Guide 1.147, Revision 13. Code Case N-498-4 has been conditionally accepted in Regulatory Guide (RG) 1.147, Revision 13. Please review Code Case 498-4 with the conditions identified in RG 1.147, Rev. 13, and determine if relief is still needed.*

Response

We request that Relief Request SPT-002 be withdrawn. Dominion will follow approved Code Case 498-4 with the conditions identified in RG 1.147 Rev. 13.

SPT-003

*Please provide a list of and the configuration for the approximately 20 small diameter vent, drain and sample lines for which relief has been requested.*

Response

The specific Class 1 small diameter lines for which we are requesting relief are as follows:



#	DRAWING/ COORDINATES	LINE NUMBER	BOUNDED BY	FUNCTION
1	11448-CBM-083B-3-3/E-7	¾-RC-165-1502	Flange to #5	Vent
2	11448-CBM-083B-3-3/E-7	¾-RC-172-1502	Flange to #6	Vent
3	11448-CBM-083B-3-3/E-7	¾-RC-163-1502	Flange to #8	Vent
4	11448-CBM-086A-3-1/D-4	¾-RC	1-RC-154 to flange	Drain
5	11448-CBM-086A-3-1/F-5	¾-RC-165-1502	1-RC-9 to #1	Vent
6	11448-CBM-086A-3-2/F-5	¾-RC-172-1502	1-RC-48 to #2	Vent
7	11448-CBM-086A-3-2/D-4	¾-RC	1-RC-84 to flange	Drain
8	11448-CBM-086A-3-3/F-6	¾-RC-163-1502	1-RC-80 to #3	Vent
9	11448-CBM-086A-3-3/D-7	¾-RC	1-RC-156 to flange	Drain
10	11448-CBM-086A-3-3/C-4	¾-RC-161-1502	1-RC-103 to flange	Drain
11	11448-CBM-088C-3-1/E-7	¾-CH	1-CH-366 to flange	Drain
12	11448-CBM-088C-3-2/C-8	¾-CH	1-CH-325 to flange	Drain
13	11448-CBM-088C-3-2/C-7	¾-CH	1-CH-335 to flange	Drain
14	11448-CBM-088C-3-2/C-6	¾-CH	1-CH-351 to flange	Drain
15	11448-CBM-089B-3-4/F-8	¾-SI-401-ICN9	1-SI-421 to 1-SI-422	Test connection
16	11448-CBM-089B-3-4/E-8	¾-SI-403-ICN9	1-SI-424 to 1-SI-425	Test connection
17	11448-CBM-089B-3-4/D-8	¾-SI-405-ICN9	1-SI-427 to 1-SI-428	Test connection

#### SPT-004

*The licensee proposes to perform an alternative examination of the lower reactor vessel head for evidence of boric acid leakage/corrosion each refueling outage when the containment is at atmospheric conditions, in lieu of the ASME Code requirement to perform a VT-2 examination of this area at elevated temperature and normal operating pressure conditions. The licensee should describe their proposed alternative examination in detail, including whether or not they will inspect the bare metal surface of the lower head (i.e., above the insulation). Include in your discussion a description of the plant conditions at the time of inspection. In light of the lower reactor vessel head penetration leakage issues recently discovered at South Texas Project Unit 1, explain how your proposed alternative examination will be effective in demonstrating that lower vessel head integrity is maintained.*

#### Response

In a letter dated September 22, 2003 (Serial No. 03-459), Dominion responded to NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," for Surry Units 1 and 2. The response for Surry Unit 1 that was provided in Attachment 2 of the submittal was the required ninety-day response that was required for units that did not have a scheduled Fall 2003 outage. In summary, Dominion's response for Surry Unit 1 included a commitment to perform a bare-metal visual examination of the fifty lower reactor pressure vessel (RPV) head bottom-mounted instrumentation (BMI) penetration nozzles during the Surry Unit 1 refueling outage currently scheduled for Fall 2004. Should

evidence of boric acid deposits be identified on any of the BMI penetration nozzles, the finding will be entered into the corrective action program for tracking, root cause determination and disposition/resolution of the condition. Any such deposit will be carefully evaluated to determine the most likely origin of the material based on visual, physical, and chemical evidence, as appropriate. Visual evidence will be evaluated with consideration of the guidance and examples given in industry reference materials for similar inspections of RPV upper heads supplemented by the recent observed conditions at the South Texas Project. Relevant physical evidence will be collected in a methodical manner that is intended to provide reliable, documented data for use in the evaluation process. Chemical and radioisotopic analysis techniques may be employed where appropriate to help discriminate between indications with operational implications versus indications from outage-related sources.

Bare-metal visual examinations of the BMI penetration nozzles will be performed during subsequent refueling outages for Surry Unit 1. This schedule may be adjusted in the future should ongoing research and inspection results justify a less frequent performance-based sample inspection schedule. Should it be determined that the inspection frequency could be reduced in the future, we would notify the NRC accordingly. Inspections outside of the insulation will continue to be performed as discussed in the relief request when the reactor containment is at atmospheric conditions, and the reactor vessel is at ambient temperature and pressure.

Consequently, the performance of the inspection on the outside of the RPV lower head insulation in conjunction with the bare-metal visual examination of the BMI penetration nozzles discussed above will effectively demonstrate that lower RPV head integrity is being maintained.

*The following questions relate to the fourth interval IS1 program in general:*

- 1. Sections 4.5 and 5.9 of WCAP-14572, Revision 1 -NP-A, Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report, February 1999, discuss periodic updates of the risk informed (RI)-IS1 program. Page 243 states that, "[e]ach subsequent 10-year interval should include, as a minimum, a reevaluation of the risk informed process," Please describe your reevaluation process.*

#### Response

Dominion is an active participant in the NEI/WOG/EPRI effort to develop "living program" requirements. These rules are admittedly late and have not been promulgated to the industry for use at this time. Recognizing the delay, Dominion proceeded on its own in September of 2002 to begin an update process on Surry Unit 1 that incorporated the essentials of WCAP-14572 Revision 1-NP-A in a comprehensive review. The update considered each of the WOG process points starting with segment definitions and required incorporation of relevant changes

associated with new design, industry/plant experience and the PRA. Upon completion, the numerical results indicated a change of approximately 20 to 30% of the segments from their original numerical classifications. This change was not expected and not desirable from an ISI scheduling perspective (e.g., new locations, new examination drawings, new ISI schedule). Considering the status of the industry rules, and the additional information that the Surry PRA was going to be updated for possible Option 2 participation, a decision was made to re-run the results with the new Surry PRA. An expert panel meeting is planned to review these new results during the first quarter of 2004. The information we have learned from our update experience has been shared with the industry groups developing the new rules.

2. *In a letter dated June 13, 2002, Virginia Electric and Power Company (Ref. 1) proposed to perform VT-2 exams on high safety significant socket welds and their associated branch connections, NPS 2 and smaller in lieu of the Code required surface exam or the volumetric exam directed by the Westinghouse Owners Group methodology in WCAP-14572, Revision 1-NP-A. Aside from this change, what changes in inspection locations or techniques have been implemented due to your reevaluation?*

Response

As indicated above no new changes have been implemented due to the reevaluation. Changes will be incorporated as appropriate following the planned expert panel meeting scheduled for the first quarter of 2004. Unit 1 fourth interval RI-ISI examinations are not scheduled until the Fall of 2004 allowing time for change incorporation, if required.